CHEMICAL INDUSTRIES

VOLUME XXXVI NUMBER 3

Stop, Look, and Listen!

BOTH proponents and opponents of N. R. A. should pray devoutly that this law will be scrupulously weighed before any continuing legislation is passed by Congress. For good or ill the effects of N. R. A. reach all business very directly, and the hard task of fairly judging these effects and forecasting their eventual results should be undertaken with the sober determination to find the best solution for the entire country. The time for ballyhoo has passed. It is no time for prejudiced partisanship. Politics are quite beyond the question.

The real facts are going to be extremely difficult to find. No creditable figures are available to prove how much, or how little, employment was helped or wages raised. Strong efforts to pass child labor amendments indicate that its best friends doubt the practical results of this widely heralded accomplishment. Section Seven A pleases neither employers nor workers, but no one claims that this mutual dissatisfaction is plain proof of its justice or wisdom. Attempts to control production and fix prices under the codes are slipping, yet the granting of such powers to industry are bitterly attacked. Code provisions of fair trade practice are criticised as throttling little business and openly flouted as unenforceable.

All this confusion is worse confounded by contradictory court decisions. The one agreed fact is that the potency of N. R. A. as a panacea for our economic ailments has evaporated. All else is debatable.

Unless N. R. A. is simplified and clarified so that the people can understand what it proposes to accomplish and can believe that it is able to do what it proposes, it will fail of its objectives. It has aroused such antagonisms and it has caused so many irritations that its enforcement will be a hopeless task unless the nation's business people, those whom it was originally proposed to help, are convinced that it is reasonable, fair, and useful. This is a situation that everyone in Washington should understand and face squarely.

Bargaining for Manganese Ore

Whether the Brazilians or ourselves have the better of our recent manganese bargain is a matter of conflicting opinion; but there is great unanimity among competent metallurgists and ordinance experts that this metal is a prime war necessity and its procurement a complicated, critical problem for the United States. Those points upon which recognized, disinterested, American authorities agree should have had first consideration, but motives prompted by Secretary Hull's enthusiasm for reciprocal tariffs appear to have had great weight. Had he been a little less keen to make a showing as a bargainer, he might have made a shrewder deal and accomplished more definitely less disturbing results.

Over and above stocks on hand and domestic production, two years manganese requirements, in event of a first class war, are 921,000 tons of ferro grade ore. This is the estimate, for the period of the Army's regular procurement program, made last year by the Manganese Subcommittee of the American Institute of Mining Engineers on Industrial Preparedness; and Minot C. Weld, Brooks Emeny, and others have suggested the purchase of a million tons of ferro grade ore for a national stock pile.

Barter of American goods or foods for such a tonnage of Brazilian raw materials would have been a pleasant aid to international trade; it would have helped the world manganese market without hurting the avowedly weak American producers; it would have strengthened our defences; it could have been liquidated in three years by the revenues from the present manganese tariff on imports for current needs. From our chemical point of view such a barter appears to be a better bargain.

A Bargain in Potash

In sharp distinction to this manganese bargaining we might make a profitable bargain in potash that illustrates clearly the nationalistic, as compared with the international, point of view.

American farmers are buying potash this season more cheaply than they have ever before secured this essential plantfood. This is due partly to the depression of all commodity prices, but more to the breaking of the Franco-German monopoly and the establishment of an American potash industry upon the basis of very effective competition. Present low prices are a drain upon what is truly an infant industry of vital importance to our chemical integrity and agricultural independence. At the record-low prices, however, the three American producers could prosper provided they might increase their sales by the extent of our importations.

Our Government might make a bargain with our potash producers. In recognition of the key industry they have given the country, a three year potash embargo might be declared upon condition that the present abnormally low price be not raised during that period.

Imports last year were 382,196 tons of all grades of potash salts, which converted into 25 per cent. K_2O, the grade mined in New Mexico, represents 580,000 tons of American potash. For this imported potash we paid $7,761,125.

Additional American production of 580,000 tons would employ about 800 more men whose pay would be about $1,450,000. The freight bill would be about $3,900,000.

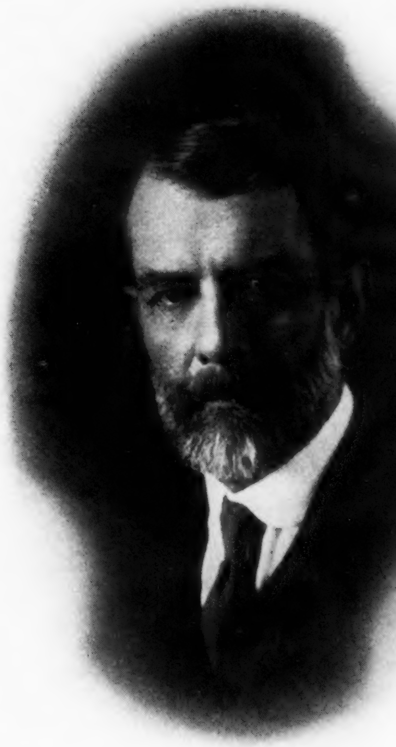
To say nothing of new capital investment in increased plant and more homes both at Trona and Carlsbad, taking no count of the goods and services this added business and its employees would consume, omitting the state and national income taxes and the federal and New Mexican mining royalties, this 580,000 tons of potash business kept within the United States at the lowest price farmers ever paid, would pay out in three years $4,350,000 in wages and $11,700,000 for freight. To keep $23,283,375 in pocket and to establish firmly a key industry able to break a foreign monopoly that for many years has taken more than ten million dollars each season out of the pockets of American farmers, seems just about as good a tariff bargain as Secretary Hull will be able to find.

A Necessity That Becomes a Virtue

Chemical companies are becoming merchandising conscious and chemical executives, who in the past have looked upon the drum, keg or barrel as just a container, are beginning to see in them aids in creating greater sales volume. A number of companies are becoming vertical rather than strictly horizontal in the type of products manufactured, and producers of bulk industrial chemicals are becoming manufacturers of ultimate consumer products, often called chemical specialties, presenting packaging problems involving cans, bottles, and cartons. American Cyanamid has a packaging expert on its staff. Merck has a container stylist at Rahway.

To foster this greater appreciation of the latent merchandising possibilities of proper packaging in the chemical and allied fields, we introduce with this issue a new section, "Packaging, Handling and Shipping." Tell us if it is helpful and how we may make it more useful to you. The only justification for its existence is that you become the beneficiary of new ideas for better handling, packaging and shipping your products.

A Great Chemical Scout



IF, over sixty years ago, a New York oculist had not first made the mistake—the same one which since has been repeated by many others—of confusing the families of Ernest C. Klipstein and August Klipstein, a great deal of interesting and important chemical history would never have been written. As a matter of fact, it is necessary to go back to Germany to the late years of the seventeenth century to find a common ancestor of these two Klipsteins who were so prominent and for many years so closely connected in the American chemical industry. They were brought together in 1875 by the merest chance.

At that time, Ernest C. Klipstein, inspired by the traditions of his family, was working in a drug store in his native town of Marshall, Virginia, as the proper preliminary training for a medical career. August Klipstein, who had come from Germany a few years before, had established himself in New York City as an importer of dyestuffs and chemicals.

Ernest Klipstein's sister had broken her eyeglasses and sent them to be repaired to an oculist in New York who, in the polite Victorian language of the time, enjoyed the patronage of the rising young chemical merchant, August Klipstein. By some mistake the glasses of August Klipstein were shipped off to the sister of Ernest Klipstein in Virginia. In those days this meant a serious delay. We can well imagine that the busy and exacting Mr. Klipstein in New York took such carelessness tartly, and no doubt the thin jacket of some hapless oculist-apprentice was properly smoked. But this ill-contrived error had a most fortunate conclusion. Quite natural curiosity roused by the common surname, led to correspondence between the two families.

The letters from the chemical importer stirred the young drug clerk. He was quick to realize that a dyestuff and chemical warehouse in New York held much bigger opportunities than a pharmacy in a small town in Fauquier County, and he was not slow to grasp the chance of improving his prospects. With no better introduction than the oculist's mistake and no stronger claim upon the consideration of his prospective employer than a common great-great-great-great grandfather in Germany a century and a half back, he set out for the Metropolis, resolved to enter the chemical business through the door at 32 Platt Street over which neat gilt lettering on a black sign proclaimed:

A. KLIPSTEIN
Importer and Commission Merchant
DYE STUFFS, CHEMICALS, &c

With some misgivings, as August Klipstein confessed years later, he was engaged. It was agreed that he was to be paid eight dollars a week and that out of this handsome salary he should board himself. In view of the name and the custom of that time, when young assistants often slept in the store or warehouse and ate with the proprietor's family, these arrangements were unusual. Plainly, August Klipstein did not intend that even the thin thread of relationship was to be pulled by his new clerk from Virginia; and it is not unlikely that young Ernest Klipstein still looked upon the chemical business as but a stronger springboard to medicine. Whatever may have been the natural misgivings and contrary ambitions at that time, ten years later August Klipstein took Ernest Klipstein into equal partnership in the firm which at that time became known as A. Klipstein & Company.

When he first came to New York, Ernest Christian Klipstein was twenty-three years old, having been born on Christmas Eve, 1851. The homestead that was his birthplace had been built by his grandfather and is still in the family's possession. It stands close to the town of Marshall, in the northwestern corner of Fauquier County, amid rolling farmland that stretches to the

bold rampart of the Blue Ridge Mountains but a few miles away. It was across the Blue Ridge, in the city of Winchester, at the head of the Shenandoah Valley, that his great grandfather, the first of the family in America had settled at the close of the Revolutionary War.

Dr. Philip Klipstein had crossed the Atlantic in a British troopship, the surgeon of the division of Hessian mercenaries brought over to fight the rebellious colonists. After the surrender at Yorktown, the young German doctor, since he liked the country and bore no grudge to his victorious neighbors, decided to stay in the United States. He selected Winchester, the most important town of northwestern Virginia, as his future

Mr. Klipstein's family at Lake Hopatcong, where they spent many summers. The coachman, William Scott, was for years a faithful family retainer, traditionally famous for his unfailing good humor and his twelve children.

home. Trained medical men were very scarce in the country in those days and he was considered a real addition to the community. His skill as a physician, his university-trained education and liberal ideals, his friendliness and sound character, soon won him a welcome on personal as well as professional grounds. He married and became the father of five sons.

One of these five sons, Philip Klipstein, Jr., inherited not only his father's name but also his profession. With that sturdy independence that seems always to have characterized the Klipstein men he chose to leave Winchester, and rather than inheriting his sire's practice, to make his own career in Fauquier County just east of the mountains. He married Sarah Ball, a pretty daughter of the distinguished Virginia family founded by the doughty Colonel William Ball. An uncle of the second Dr. Philip Klipstein's bride had been a Quartermaster General of the Continental Army and the mother of the great George Washington himself, Mary Ball Washington, was her aunt. With such important social connections, the young physician who had built his home on the outskirts of Marshall, soon assumed a rather important position in aristocratic Fauquier County.

Dr. Philip and Mary Ball Klipstein had three sons, the youngest of whom, Philip Augustus became a merchant-farmer in Marshall, dividing his time between the management of the home farm, which he inherited, and a business in the town that combined a country store and produce commission brokerage. He fought through the Civil War with the Eighth Regiment of Virginia Infantry, attached to Pickett's Division, returning after hostilities to his farm and store at Marshall where he died in 1905. He married Amanda Louise Hixon, a daughter of James Hixon, a patriotic Quaker who, despite his religious scruples, had fought bravely in the Continental Army during the Revolution. Shortly after that war he had left his old home in New Jersey and settled in Louden County, Virginia. Like the younger Dr. Klipstein, he had married a daughter of a well known Virginia family, Mary Hampton. To his daughter Amanda and her husband, Philip Augustus Klipstein, there were born three sons and two daughters. The oldest of the sons was Ernest Christian Klipstein.

The youthful "E.C"—as years later he was known to distinguish him from his older chemical partner "A."—was just ten years old when his father went off to fight in the war between the states. Those must have been exciting times for the family. Just to the

Mr. Klipstein's home at 116 Prospect Street, East Orange, N. J., taken in 1898, with the two older Klipstein boys, Ernest and Gerald, and their next door playmate, Marion Spaulding.

east of Marshall are Bull Run and Manassas and Fairfax Courthouse. Important battles were fought all about them. The Klipstein farm flanks the main road going west through the gap in the Blue Ridge that comes out at Strasburg in the Shenandoah Valley. For four years the armies, first in grey and then in blue, marched back and forth, back and forth over that highway. There were cavalry raids, counter attacks, and hurried retreats in bewildering, constant succession, and worst of all, marauding parties of semi-independent guerillas kept scouring through the nearby gap.

In the midst of these dangerous excitements young Klipstein spent four most impressionable years of

his youth. They steeled his physical courage and tempered his tolerance; but what he always sincerely regretted they interfered with his schooling. He managed, however, by hook and crook to get sufficient primary education to enable him to attend Roanoke College for the term of 1867-68 and to acquit him creditably. But the family fortunes, sadly depleted by the war, forced him to leave college, and the next three years he taught school in western Virginia. The following year he pioneered as a school teacher out in what were then the wilds of Arkansas; but he returned to Marshall determined to become a physician like his grandfather and his great grandfather. With money saved from his schoolmaster's stipend, he enrolled in the College of Physicians and Surgeons in Baltimore, eking out both his capital and his experience by working during vacations in the pharmacy in his native town. It was at this point that his sister's broken eyeglasses and a letter from a namesake in New York switched him to the chemical career in which he was to win such distinguished success.

When first he joined the staff of August Klipstein as a very modest assistant clerk he observed that, in the business of importing dyes and chemicals it was going to be necessary for him, if he were to climb up the ladder, to learn both German and French. He knew not a word of either. But in the office he had plenty of opportunity to learn German, and this he assiduously set out to do, begging that his employer and his fellow employees, several of whom were Germans, talk this language to him, deliberately struggling with German trade papers and chemical textbooks, and later tackling the German correspondence of the firm. French presented a more difficult problem, which he solved by going to board with a French family. Having mastered French, since business with South American countries was beginning to open up in dyewoods and tanning extracts, he left his French friends and went to live in a Spanish household. He was a ready, natural linguist, for later having a mastery of both reading and speaking German, French, and Spanish, he acquired a good working knowledge of Italian, Dutch, Swedish, and Portuguese. When his own sons came along, he insisted upon always talking to them in German, on the theory that they would thus be assured at least two languages. German became so the family habit that the boys never spoke to their father in English.

Languages were not the only studies that the young ex-medical student from Virginia followed through vigorously during the early days of his association with the house of Klipstein. He brushed up on the little chemistry he had been taught and went rather seriously into the complicated matters of dye applications and the uses of tanstuffs. In the meantime he worked his way out of the office onto the road and became in short order one of the best salesmen.

Young E. C. Klipstein liked meeting people. He was a thorough-going eccentric, interested in men, in materials, in processes. Friendly and helpful by disposition he was an early, living exponent of the ideal of service to the customer upon which the older chemical merchants so solidly built up their trade. He proved to be the ideal "contact man," while August Klipstein was possessed of remarkable financial and executive abilities which found their best and most useful expression in the general administration of the business. Together they were a strong pair, complementing each other's

A Klipstein family group, taken about the time of the war with Spain—left to right, J. H. Mills (brother-in-law), his wife, Ernest H. Klipstein, Mr. and Mrs. Klipstein and Gerald Klipstein, and the fox terrier, "Rex."

weaknesses, a truly logical partnership which built up an organization of forty salesmen, serving over two thousand customers.

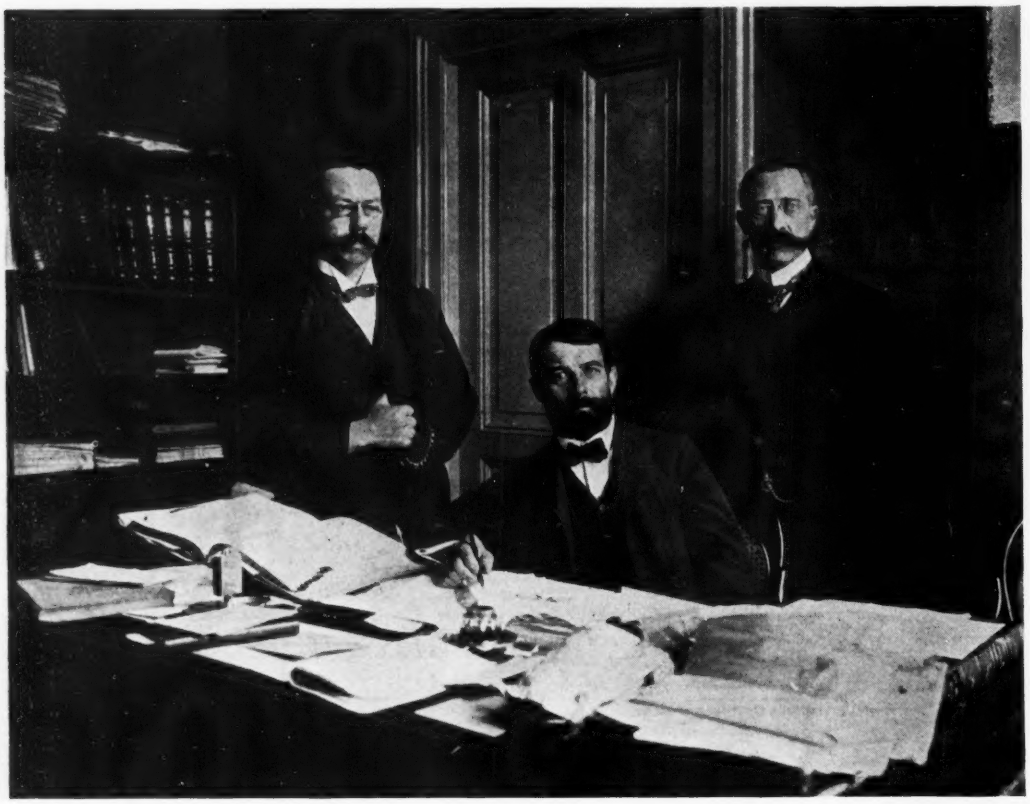
It soon came out that E. C. Klipstein, having organized the sales end of the business, began more and more to take up the work through which he made one of his great contributions to the chemical development of this country. He became the contact man for the partnership with their foreign suppliers. The Klipstein business was fundamentally that of importing all sorts of chemical materials. Every other year "E.C." took long trips abroad. Regularly he visited the Society of Chemical Industry in Basle, Switzerland, for whose dyes the Klipstein house was then American agent, and Messrs. Eichoff and Fuchs, in Frankfurt, who were the firm's chief suppliers of various heavy chemicals.

These periodical calls upon the principals completed, he was accustomed to go off on one of his famous chemical scouting trips. He visited different countries, inspecting the finest plants in all the various chemical consuming industries to see what improvements they were making in the technique of using chemical processes and calling upon many chemical manufacturers to learn what new chemical products they had developed. From these scouting expeditions of his he brought back to the United States a long list of successful chemical specialties. Thus he rendered notable services, especially to textile mills and tanneries, by bringing over to this country many new bleaches, wetting out agents, mordants, scouring and cleaning agents, dehairing preparations, bates, fillers, and what not. He was the first to import vat dyes and synthetic tanning agents, and he introduced the use of formic acid in dyeing and sulfonated oils in calico printing.

These tours of chemical exploration carried him even to South America and the Far East. The supply of our native chestnut bark for tanning was beginning to run out, and he introduced a number of tannin bearing materials, such as myrobalans from India and mangrove bark from Africa, and most notable of all, quebracho from the Argentine. This last proved at first a disappointment. Its exceptionally high tannic acid content was useless until it was discovered in Italy that the extract of quebracho might be rendered soluble in water by boiling it for an hour in sodium bisulfite. This solubility problem solved, quebracho rapidly increased in favor among American tanners, and for years the house of Klipstein was the exclusive selling agent in the United States of the Forestal Compagnie of Buenos Aires who enjoyed a monopoly of quebracho exports from Argentine.

One of the chemical finds of E. C. Klipstein was destined to have important after-effects not only upon his own business career, but also upon the course of chemical industry in this country. In Germany, about 1898, he found carbon tetrachloride. He established an exclusive sales agency for the United States, and began importing it for sale as a non-flammable dry cleaning agent. His alert brain conceived the original notion of packaging carbon tetrachloride and selling it for household use. Recognizing that its chemical name would be a distinct handicap he coined the word "Carbona" and organized the Marshall Chemical Company, with a plant in his home town, which he put in charge of his brother, James Hampton Klipstein.

In the development of a market for Carbona, E. C. Klipstein displayed to an unusual degree one of his outstanding business characteristics. Once convinced



Mr. Klipstein in the offices of his German agents Eichoff and Fuchs, of Frankfort. Left to right, Emil Fuchs, E. C. Klipstein, Max Eichoff.

of the merit of some chemical specialty, he was willing patiently and with dogged perseverance to push it on and on to commercial success. Accordingly, he spent eight years and over a hundred thousand dollars introducing "Carbona." Eventually its coined name became a household word throughout the land and sales mounted to the millions of bottles.

Having scored this commercial triumph his keenest interest in "Carbona" waned, and since the business had grown to proportions that made it a serious rival to his more serious chemical interests, in 1909 he sold three-quarters of the common stock to Abraham Wineburgh, brother of the street car advertising agent. This proved to be a wise move, since Mr. Wineburgh, by using the leftover car space at a low rate from his brother, was in a position to carry forward a great publicity campaign. Klipstein continued to supply the carbon tetrachloride, and in 1914 when supplies from Germany were cut off, this connection led to an alliance with the Warner Chemical Company and shortly to the organization of the Warner-Klipstein Company. These new enterprises were a turning point from chemical merchandising to chemical manufacturing in E. C. Klipstein's business career.

When the war broke out, the partners of the house of Klipstein were not in agreement as to the policy they were to pursue. August expected a repetition of the Franco-Prussian war and looked for a quick German victory. He was, therefore, inclined to tide over in any way the dearth of supplies of imported chemicals and to make the most of the opportunities which their intimate, expert knowledge of all chemical markets gave them in the wild scramble for all kinds of chemical supplies. Ernest Klipstein believed that the struggle would be long drawn out and foresaw that many changes in international chemical trade would be the inevitable outcome. Accordingly, he was anxious to undertake the production for themselves of certain chemicals and dyes. As sensible partners they agreed to disagree amicably. While August did not care to invest any of his own or the firm's capital in manufacturing ventures that he felt would be short-lived, nevertheless he raised no objection to Ernest doing so upon his own initiative and at his own risk.

The result was that in 1915 the firm of E. C. Klipstein & Sons began operations in a new factory building at Carteret, N. J., producing sulfur black. The "& Sons" were Mr. Klipstein's two older boys, Gerald and Ernest, their younger brother, Kenneth being still in school. Gerald soon went overseas with the American Expeditionary Forces, and Ernest, who previously had been chemist for the Dan River Cotton Mills down in Virginia, stayed on to run the new chemical plant. It expanded rapidly.

A neighbor at Carteret was the Warner Chemical Company, producers of phosphates and of carbon tetrachloride, which through "Carbona" brought Dr. Lucien Warner and E. C. Klipstein together. Warner needed chlorine badly. Klipstein was proposing to make anthraquinone, requiring chlorine for the aluminum chloride necessary for the Friedel-Crafts reaction, and he needed more caustic for the growing sulfur black output. Upon these common needs they decided to build an electrolytic alkali plant. They took in as a third partner, R. H. Nelson, whose electrolytic cells had been developed in the Warner plant. They selected South Charleston, West Virginia, being close to both brine and coal, as an ideal location, and they built the plant of the Warner-Klipstein Company.

Right next door E. C. Klipstein & Sons erected a new and larger dye plant, and began extending their line by adding anthraquinone, hydron blue, sulfur blue, and later a rather extensive line of coal-tar colors and intermediates. With a war-made famine in dyes neither greater output nor new items could come too fast. At the same time a greedy market for caustic, at prices ranging from six to eight cents a pound, made the Warner-Klipstein operation a humming success. Throughout the war expansion was rapid at both plants. The war ended: contraction and reorganization was necessary.

Mr. Klipstein promptly shut the Carteret plant and moved the sulfur black unit to South Charleston. A conscientious research was undertaken to cut the costs and raise the quality of the line of dyes and intermediates. He sold his common stock in the Warner-Klip-

MARSHALL CHEMICAL CO.,

MANUFACTURERS OF

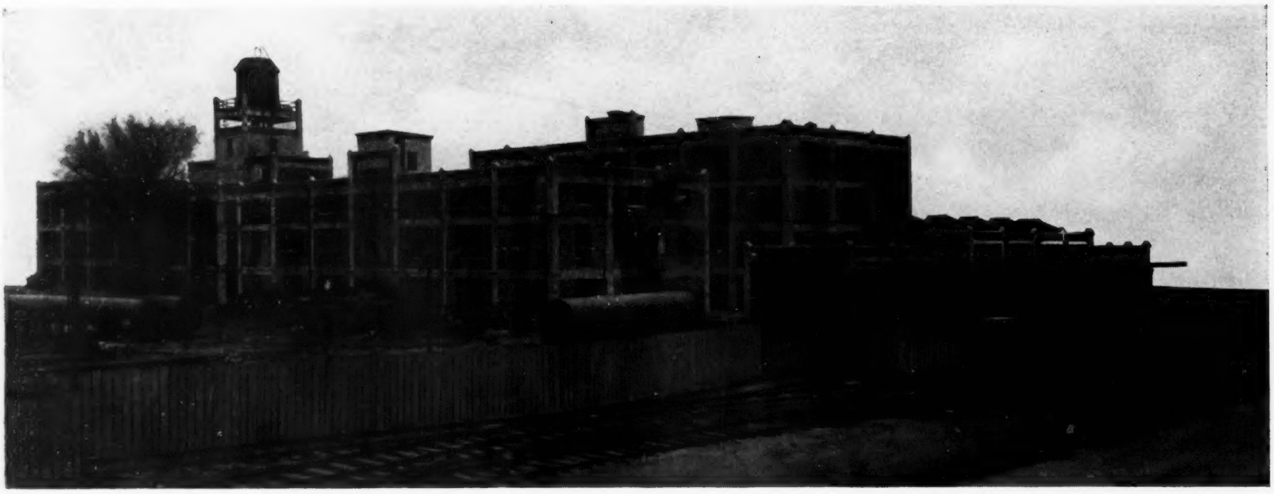
CARBONA.

Marshall, Va., 1901

Replying to your favor of

we send you under separate cover a descriptive circular, explaining the nature and merits of Carbona. In order to introduce this article we are willing to pay you ten cents on every bottle you can sell through your best druggist or grocer. At this price we have canvassers who earn from one to two dollars daily. If, after reading the circular and trying the sample sent herewith, you are disposed to try what you can do, we will send one or more dozen bottles to the best druggist or grocer in your town or neighborhood, at the regular wholesale price for same, and at the same time deduct ten cents per bottle to be paid to you on each bottle you sell This insures you the certain payment of what you earn and also that the article we offer is no humbug but sells on its merits. If you wish to make a trial please send us in enlosed stamped envelope the name of the druggist or grocer you wish to do the business, and we will arrange with him to keep stock of the Carbona for you.

Very respectfully,



Above, when the South Charleston plant was building, during the World War, one of the first of the modern chemical operations in the Kanawha Valley.

stein electrolytic enterprise, and that company was reorganized into Westvaco Chlorine Products Corporation, which in turn absorbed the older Warner Chemical Company.

E. C. Klipstein had become a whole-hearted chemical manufacturer. Chemical trading interested him no longer, and in 1922, though still retaining the joint office of secretary-treasurer, which he had held for so many years, in his old partnership of A. Klipstein & Company, he sold most of his stock to his associates. In like manner, he continued to serve as vice-president and director of the new Westvaco organization, in which he had still a considerable interest, of the Carbona Products Company, of the Bull's Ferry Chemical Company, and of the Manetto Company, A. Klipstein & Company subsidiaries.

He now concentrated his energies and his experience in up-building the dye manufacturing operations of E. C. Klipstein & Sons. Though he lived but a short year, nevertheless he laid down so firm a foundation in this new and untried field of activity that for ten years his sons continued to build this business till in 1933 it was merged with the Calco Chemical Company, subsidiary of the American Cyanamid Company.

After but a brief illness, he died, on Sunday, April 29th, 1922. At the time, one of his oldest and keenest competitors, Herman Metz said, "E. C. Klipstein was one of the most energetic and most lovable men who was ever in the chemical business; and that is a mighty rare combination of good qualities." It is a shrewd bit of characterization.

Mr. Klipstein was never idle. Yet he always found time for his friends and his family. He had married in 1888, Grace Lilian Mills, born in Hamilton, Ontario, a granddaughter of Samuel Mills, who upon the foundation of the Dominion of Canada had been one of the original Senators appointed by the British Crown. His three sons and his business were undoubtedly the always dominating interests of his life. But he always had a hobby. As a younger man he was interested in photography. About 1898 he took up golf, and for many years he was one of the most faithful players at the Essex County and Baltusrol clubs. For his age he played a capital game, and his sons' prowess they attribute to his careful training which began when each reached the age of eight. In 1916 an accident at the Carteret plant cost him two of the fingers of his right hand, which badly interfered with his golf grip, so that in his later years he played less and less.

But more and more he devoted himself to experimental work in the laboratory. Research became his recreation. At three score years and ten he plunged into the turmoil of dye making in the midst of the hurricane conditions of the World War. Having spent a full life in the service of the American chemical consumer, introducing new materials and new processes, at its very close, he became a pioneer dye manufacturer, helping manfully in the establishment of this branch of chemical industry in the United States.

Rayon Growth

Production of rayon continues to make rapid headway in most countries. According to a recent estimate, world production rose from 165.7 million lbs. in the third quarter of 1933 to 196.8 million lbs. in the third quarter of 1934. Figures for individual countries are:

WORLD RAYON PRODUCTION (In thousands of lbs.)

Country	July-September 1933	July-September 1934
United States	47,707	45,540
Japan	24,156	40,018
Italy	20,196	27,456
Germany	17,633	23,320
United Kingdom	22,890	21,490
France	14,806	19,800
Holland	5,995	5,500
Canada	1,980	2,805
Poland	2,200	2,552
Belgium	2,387	2,200
Switzerland	2,640	2,156
World (incl. other countries)	165,747	196,808

A slight decline in the output of Great Britain and the United States was accompanied by a marked increase in Japan, Italy, Germany and France. Japanese production of rayon, which increased by no less than 66 per cent. over the year, has now almost reached the level of the United States. Great Britain fell to fifth place as a producer of rayon in the third quarter of 1934.

Equipment

To Buy or Not To Buy

By James F. Rickard

SIX major points demand consideration in determining when changes of equipment in an existing chemical plant are economically justified:

1. Years required for investment to pay for itself.
2. Per cent. of operations for equipment concerned.
3. What items of cost to consider.
4. Cost factors which effect a saving.
5. Factors which may offset all or part of the saving.
6. Choice between alternative proposals.

In making any equipment purchases, we are constantly confronted with the possibility of obsolescence of the apparatus due to the development of new apparatus, or to a change in the market demand, or to the introduction of a new chemical. For this reason, under normal business conditions, it is felt in the chemical industries that an improvement should pay for itself in three years or less. In severe depression, when to conserve cash is paramount, companies are inclined to work on the basis that an improvement must pay for itself in one year.

In evaluating the expected savings, it is important to estimate correctly, based on past experience and the expectation of the future, the hours that the apparatus will work. If these computations are made on the possible production from full operating hours at all times, a false saving may be developed. This would be true, for example, if in normal times the sales department could supply orders to keep a machine busy only 50 per cent. of the time.

To bring out these conditions we will consider a piece of chemical apparatus operated by two men, normally running 2,000 hours a year, and producing 300 units per hour.

In Example 1, we propose to replace this equipment with another unit costing $15,000, which will have no greater rate of production, but which can be operated by one man in place of two, at a reduced power cost, and the same repairs and maintenance costs. This machine, by showing a 13.3 per cent. gross return on the investment, will pay for itself in 7½ years, and ordinarily would not be considered with favor.

Let us consider a second case—apparatus costing $15,000—where the number of men is the same and repairs, supplies, and power are somewhat increased per hour, but with the important difference that the rate of production is ten times greater than that of the old equipment. In this case the hourly cost of the proposed machine will much exceed that of the old equipment, but due to its more rapid rate of production there will be a gross saving, as shown in Example 2. This machine will pay for itself in two years, and the investment would be considered with favor.

A word of caution to make sure you are standing on solid ground when making a request for an improvement. Below are five of a group of set questions, which, for a number of years, I required each man working for me on improvements to answer in writing before submitting any propositions. If these questions can be answered positively you may feel fairly safe that the conclusions will be sound.

1. Have all of the elements of influence been considered?
2. Have all figures and decimal points been properly checked?
3. Have you made an approximate cross check by an entirely different method to see whether you can approximate the same answer?
4. Have you familiarized yourself with the actual operation of the process?
5. Above all, is the answer reasonable? If the computations do not give us a reaction as being "common-sense," you may be sure that somewhere your studies and calculations are unsound. By all means do not take any steps with the improvement until you have satisfied yourself in this respect.

EXAMPLE 1

COST PER OPERATING HOUR

	Present Equipment	*Proposed Equipment*
Labor	2 Men × $ .50 = $1.00	1 Man × $ .50 = $ .50
Repairs	.50	.50
Supplies	.10	.10
Power	2.00	1.50
Total Cost	$3.60	$2.60
Hours Operated	2,000	2,000
Units Produced	600,000	600,000

Gross Saving .... ($3.60 — $2.60) × 2,000 = $2,000

Gross Return on Investment .... $\frac{\$2,000}{\$15,000}$ = 13.3 per cent.

EXAMPLE 2

COST PER OPERATING HOUR

	Present Equipment	*Proposed Equipment*
Labor	2 Men × $ .50 = $1.00	2 Men × $ .50 = $1.00
Repairs	.50	.60
Supplies	.20	.30
Power	2.00	2.50
Spoilage	.50	.10
Total Cost	$4.20	$4.50
Hours Operated	2,000	200
Units Produced	600,000	600,000

Gross Saving:

Present Equipment	$4.20 × 2,000 = $8,400
Proposed Equipment	4.50 × 200 = 900
	$7,500

Gross Return on Investment .... $\frac{\$7,500}{\$15,000}$ = 50%

The problem of obsolescence is a very important one. At some time or other, the manufacturer is confronted with the problem of deciding whether or not to scrap a unit or part of his equipment. Many manufacturers have scrapped equipment when it was unprofitable to do so. On the other hand, many manufacturers have failed to scrap apparatus where it would have been profitable to do so.

Any machine is effectively obsolescent when production can be carried on more cheaply by replacing it with an improved one, after adding in the original cost of the old machine (less its scrap value and less the actual physical depreciation to date) to that of the new machine.

To calculate whether a unit is obsolete can be best demonstrated by taking the typical following case:

A manufacturer has apparatus purchased three years ago at a cost of $24,000. Its cost of operation (labor, power, etc.) is approximately $21,000 per year. The total life of the equipment is estimated at six years. At present, there is a greatly improved unit, with a slightly larger capacity on the market. Because of its ease of operation (needing no skilled attention), and the actual saving through recently-made improvements, the cost of operation is reduced to $16,000 per year. The cost of the new machine is $40,000.

Should the manufacturer keep the old apparatus in operation, or should he scrap it and buy the newly improved type?

The two elements which enter into the cost of production are: (1) the unrecovered investment; (2) the operating expenses, which consist of items such as power, labor, etc. By unrecovered investment is meant the original cost of the machine, less the actual depreciation. In the case of the old machine, the unrecovered investment is determined thus:

Cost of old machine	$24,000.00
Estimated scrap value at end of 6 years	1,000.00
Amount to be depreciated over life of machine—6 years	$23,000.00
Depreciation for one year—23,000 ÷ 6 =	3,833.33
Depreciation to date (3 years)	11,500.00

Putting the above data in concise form, matters stand as follows:

Unrecovered Cost		*Old Machine*	*New Machine*
Cost	$24,000		
Depreciation	11,500	$12,500	$40,000
	$12,500		
Current Operating Costs..		$21,000	$16,000

If money is worth 6%, the capital cost of operating the old machine is: $21,000 ÷ .06 = $350,000. That is if the operating expenses are capitalized, it is equivalent to a capital investment of $350,000. On the other hand the capitalized cost of the new machine is $16,000 ÷ .06 = $266,666.70. Adding these to the original costs of the respective machines, we have the following:

Old Machine		
Original Cost Less Depreciation		$ 12,500.00
Cost	$24,000.00	
Depreciation	11,500.00	
	$12,500.00	
Capital Operating Costs		350,000.00
Total Capitalized Cost		$362,500.00
New Machine		
Original Cost		$ 40,000.00
Capitalized Operating Cost		266,666.70
Total Capitalized Cost		$306,666.70

From the above illustration, it is evident that a very large saving would result if the old machine were scrapped. If we scrapped the old machine, our loss on the old machine would be ($12,500 less scrap value $1,000) $11,500. Adding this loss to the final capitalized cost of the new machine would give the final cost of $306,666.70, plus $11,500 or $318,166.70 as compared with the total capitalized cost of the old machine of $362,500. By scrapping the old machine, there would be a savings of $362,500 less $318,167.70 or $44,333.30.

The problem of inadequacy and replacement is one very similar to that of obsolescence, but differs in this respect: The question of inadequacy is one of size and power, while that of obsolescence is one of type and quality.

When a given unit becomes inadequate, the manufacturer must consider whether it is cheaper to add another unit of the old type or whether he should scrap the old and purchase a new unit with a larger capacity.

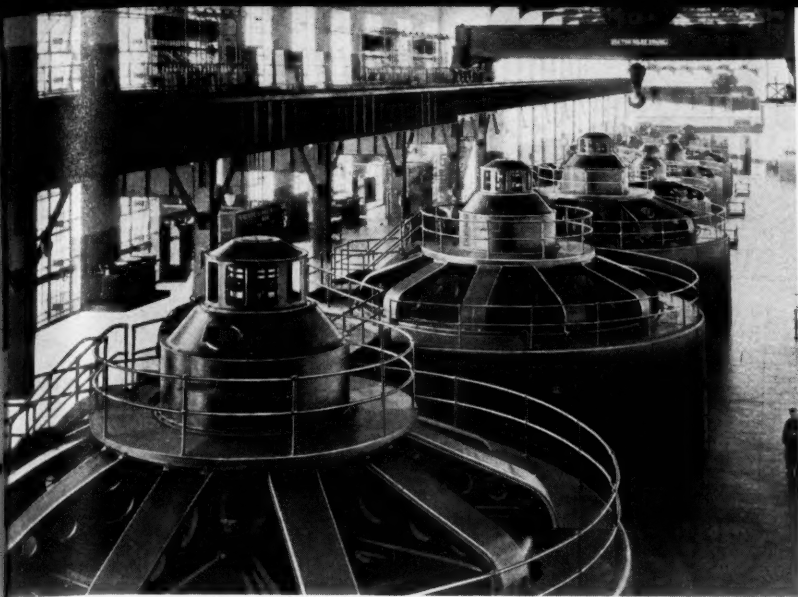
Let us assume that the manufacturer is faced with this problem:

Apparatus with a capacity of 300 units per hour has been in operation for 2 years. This unit is now inadequate, and he wishes to increase the capacity to 600 units per hour. The cost of the 300 per hour unit is $13,000; that of the 600 unit per hour machine is $20,000. The life of the old apparatus is estimated at five years and the amount of depreciation to date is estimated at $3,680. Assuming that the operating costs are approximately the same for both types, we have the following case:

Old Apparatus	
(Cost, less depreciation) $13,000 — $4,680 = ...	$ 8,320.00
New machine of same capacity—cost	13,000.00
Total cost of two machines	$21,320.00
New Machine—600 unit per hour—cost	$20,000.00

From the above illustration it is evident that it is more economical to add another 300 unit per hour apparatus than to scrap the old type and substitute the 600 unit per hour type. For, if the 300 unit per hour apparatus were scrapped, matters would stand as follows:

New Machine (600 unit per hour)		$20,000.00
Old Machine (300 unit per hour)		
Cost, less depreciation	$8,320.00	
Less scrap value	1,300.00	
Loss on old machine if scrapped		7,020.00
Total cost of new machine		$27,020.00
Loss if machine were scrapped		5,700.00



At Niagara Falls

Power Plus—

By Williams Haynes

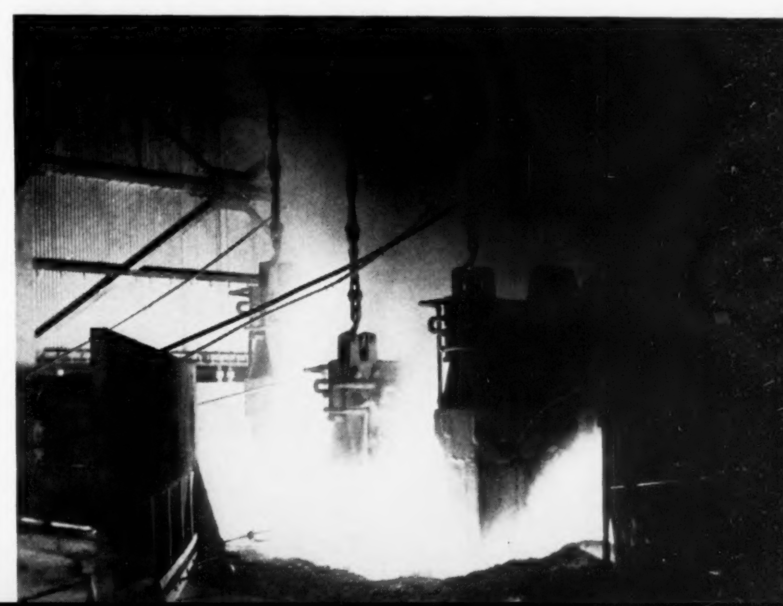
EXACTLY four decades ago, in 1895, a new epoch of greatest importance to our chemical industries opened. In that year at Niagara Falls, there became available for the first time in America a considerable block of cheap electric power. By today's standards it was not very cheap and not at all considerable since the total available horse power was fifteen thousand which is less than the consumption of any single one of half a score electro-chemical plants now located there.

This tiny power station, with its three 5000 h.p. generators, appeared at the right moment. It was the culmination of over forty years of discouraging pioneering on the part of Jacob F. Schoellkopf—a name illustrious also in the early annals of the American coal-tar dye industry—a far-visioned leader, who with his shrewd associates created Niagara power, yet failed to foresee its future.

They expected to attract to Niagara Falls great rows of textile mills, woodworking shops, shoe factories, and all sorts of other fabricating industries. In that expectation, they laid out block after block of streets, lining them with young maples and elms, preparing to house a vast army of industrial workers. Their slim saplings have grown to sturdy trees, but many of the broad streets of their real estate developments have been turned into a public park. Yet the plants of Niagara Falls use today such vast quantities of electrical power as in their most optimistic calculations they would not dared to have guessed. The teeming industrial city that they dreamed has become the greatest electro-chemical center in the world. But instead of crowded factories turning out calicoes and slippers, wrenches and clothespins, there are a few vast plants employing comparatively few people but literally chewing up great chunks of electrical energy in electrothermic and electrolytic operations producing alloys and chemicals.

Just at the time that their 15,000 h.p. of electrical energy came on the market, two of our great industrial discoverers had perfected the preliminary work on their revolutionary processes and were seeking large quantities of cheap power to develop them commercially. In 1886 Charles M. Hall had discovered that aluminum can be extracted from bauxite by electrolysis in a cryolite bath. A couple of years later, in Pittsburgh, he brought this process into industrial operation on a small scale and organized the Pittsburgh Reduction Company. By 1895 he had smoothed out the plant-scale operation and was ready to expand. Naturally he came straight to Niagara Falls, and George Shepherd, who sat in at the earliest negotiations, has told me just what sort of a loose-tongued, scatter-brained inventor he was thought to be when he contracted for 3000 h.p. and wanted them to promise him 10,000 in another year. On the heels of Charles Hall came Edward G. Acheson seeking 1000 h.p. for a plant in which to fuse silicon and carbon into carborundum. The following year Hamilton Y. Castner arrived, and in 1897 the opening of the Mathieson Alkali Works marked the first Niagara Falls electrolytic operation.

Sandwiched in between the establishment of the Niagara operations of the Aluminum and Carborundum companies in 1895 and of the Mathieson Alkali in 1897 came the building of the first unit of what has become the Union Carbide and Carbon. It was but a very modest forecast of this corporation's present great plants: four little 250 h.p. carbide furnaces, engaging



Above, the source of Niagara Falls power. The generators at the new power station. Right, the biggest electro furnace in the western hemisphere, at the Cyanamid Niagara Falls plant.

The Union Carbide and Carbon Niagara Falls plant from the air. In the foreground stock piles of finished materials, and behind the plant stock piles of raw ores, limestone, and coal.

the services of eight men. Each of the initial furnaces was only one-one-hundredth the size of their modern furnaces, while the present payroll numbers over twelve hundred and at peak operation has reached a total of over two thousand. Of this staff one man has been at the Niagara Falls plant the full thirty-eight years of its existence; eleven have been there more than thirty years; twenty-one have more than twenty-five years of continuous service.

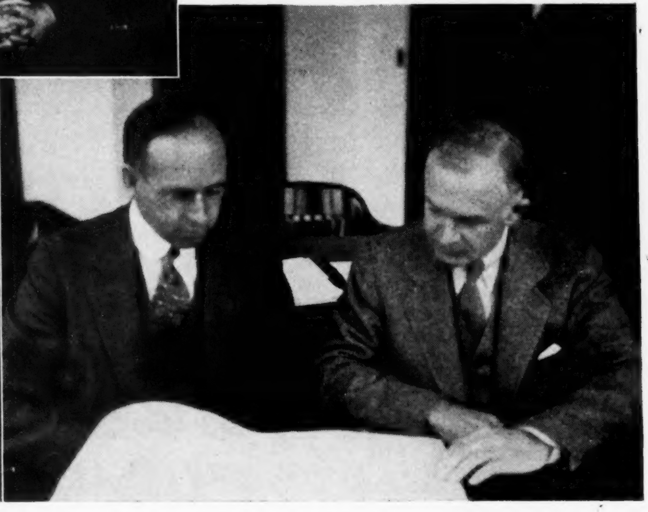
The premier of the veterans is the man today in general charge of the operation, James G. Marshall, who took infinite pains to play most successfully the part of unofficial host during my Niagara Falls visit. He provided me the pleasant opportunity of meeting all the various chemical plant "heads" at a dinner at the Niagara Club. He lent me a well informed and most obliging traveling companion. He lost no chance to make my visit enjoyable and profitable. I could not have had a more generous and thoughtful sponsor, nor certainly could I have found a better mentor and guide than the "oldest, livest chemical inhabitant."

On April 27th, 1896, when he, just graduated from Penn State, came to tackle his first—and his only—job, the plant had power from six in the evening till midnight; and the operating force made ready in the forenoons with the afternoons off. Young Marshall was what would be called electrical engineer. There was one chemist in the group, two foremen, and four laborers.

The sole product was calcium carbide, manufactured under license from the Electro Gas Company, which had acquired the original patents of Willson, and that

Below, the author at the Union Carbide plant, with James G. Marshall, General Manager of the Niagara Falls operations, and Norman Duffett, Superintendent of the Niagara Falls plant.

Center, H. T. Reid, Superintendent of the carbide and graphite plants of the National Carbon Company, and below, J. A. Holladay and E. B. Field, who have charge of Carbide's new research laboratories.

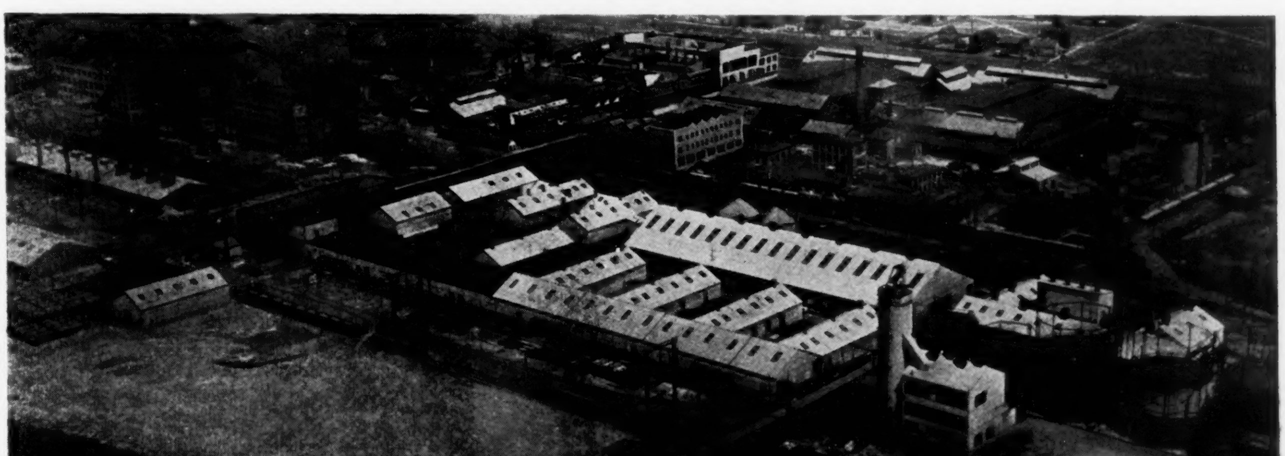


Below, Dr. Earl A. Harding, General Works Manager of the R. & H. plant of the du Ponts; center, J. W. Pershon, in charge of the Carbide & Carbon's chemical operations at Niagara; and right, Waldo C. Hovey, at the General Manager's desk at the Niacet Chemicals Corporation.

product was marketed by the Acetylene Light, Heat & Power Company which held the New York state sales rights. This too-elaborate complication of state companies fell apart, and the Union Carbide Company grew out of that impractical scheme. Later to take full advantage of the cheaper costs of bigger blocks of power, there was to be added to the calcium carbide, ferrosilicon to which in time have been added ferrochrome, ferromanganese, ferrovanadium, and other ferro-alloys and metals.

These ferro-alloys are the basis of a remarkable business, a sort of tailor-made metallurgy, dealing in ton lots of electric furnace products that sometimes are required to meet specifications as exacting as one-half of one per cent. When you see a great clawed bucket swoop down from an overhead crane into a baby mountain of crude ore, swing its load into a hopper feeding to a mixing bin literally as big as a house, it is not easy to believe that this giant's mix of ore and flux will smelt out into great iron carloads of molten metal that analyzes in the test-tube to a fraction of a per cent. During the past thirty years these ferro-alloys have become prime essentials of a score of key industries. They are used in steel making where they have two extremely important functions to perform. First, they are reagents to take gas out of melted steel in order to assure sound castings. Second, they become ingredients added to modify in definite, desirable ways the characteristics of steel. As samples, 12 per cent. of manganese makes abrasive resistant steel; 2-4 per cent. of chromium is ball-bearing steel; 20 per cent. of tungsten becomes high speed steel. Since the partic-

The R. & H. Division of the E. I. du Pont de Nemours & Company, Inc., at Niagara Falls, from the air.



Breaking up the furnace and removing the great chunks of blue black silicon carbide that become carborundum abrasives.

ular properties of these specially modified steels are becoming more and more accurately known and the more and more exacting requirements of the steel users must be filled, this business approaches closer and closer the paradox of C. P. quality produced in ten ton batches from a metallurgical furnace out of highly varying raw materials.

"It is," as Norman Duffett, superintendent of this large-scale, fine-grade operation, put it, "a very pretty example of a big rule o'thumb industry transformed by exact chemical control." We had been through the plant and were driving across to the new laboratories. Here, in a big, new building, specially designed and specially constructed, all of the research (formerly carried on chiefly at Long Island City) is now centralized. Under J. A. Holladay, with B. E. Field and Ernest F. Doom as lieutenants, the staff of 150 chemists, metallurgists, micro-photographers, librarians, were, at the time of my visit, just assembling; settling themselves in their model quarters; erecting apparatus,

Packing and making ready the electric furnace in which a mixture of clay and coke is fused into the great chunks shown above.

arranging record files and reference works, making themselves very happily at home.

On the way back to lunch at the plant's own cafeteria, we stopped to inspect the experimental furnaces. Here, housed in their own building, are a battery of four electric furnaces of varying size, where all sorts of new ideas can be practically worked out under the energetic and experienced direction of E. F. Doom; and where, too, special orders for small or experimental lots of some odd grade or some peculiar analysis are filled literally to the special order of some exacting customer.

Not everyone knows that just beyond the big plant lies a smaller operation of the Carbide and Carbon Chemicals Corporation, erected in 1929 with the laudable purpose of turning to good chemical use the generous supplies of carbon monoxide gas which had previously been going to waste. The operation, which since the plant opened has been in charge of J. W. Pershon, who came to Niagara Falls from South Charleston, begins with treating carbon monoxide with steam to get carbon dioxide and hydrogen. The carbon dioxide is the basis of the large dry ice production that was formerly compressed and solidified by the Dry Ice Corporation; but has been taken over by Carbide Chemicals since April, 1933, though most of the output is still marketed by the Dry Ice organization. The hydrogen plus more of the carbon monoxide is the starting point of the synthesis of methanol, all of which made here is refined to 99.9 per cent. grade, and which, as one would suspect, goes chiefly into chemical markets, largely as a solvent or for organic synthesis, though much is sold for the production of formaldehyde and some as an anti-freeze and anti-rust.

When, bright and early in the morning, I called at the Roessler and Hasslacher plant of the du Ponts, I was led to a big, sunny conference room where a conclave was in session reviewing the research of the closing year and planning the operating and research developments of the year to come. Some of the general staff present were General Manager, Dr. E. A. Rykenboer; General Manager of Development, L. M. White; General Works Manager, Dr. Earl A. Harding; General Manager of Research, Dr. Sterling Temple, and General Manager of Commercial Development, Paul J. Carlisle. With the best grace in the world Dr. Harding and Mr. Carlisle left the plenary session, which had been going on several days, and escorted me through the big plant which for diversity of operations, interesting layout, and good "housekeeping" is from the strictly chemical point of view certainly one of the most interesting in all Niagara Falls.

Operations and products, as well as research for new products and better uses, all naturally group themselves here about four important chemicals: sodium, nitrogen, chlorine, and peroxide. Here the electrolysis of fused salt produces sodium and chlorine. Recently, advanced methods of handling sodium in pipe lines and in shipping it in tank cars have been perfected, and there have been of late numberless developments in the chlorinated

solvents of the general class of trichlorethylene, tetrachlorethane, and the quite recent addition to the list, hexachlorethane, a solid product with a number of most interesting new possibilities in the manufacturing industries. Most of these R. & H. chlorinated materials are produced in a great tent of a plant, that is, a corrugated asbestos building that serves simply as a roof for a veritable forest of stills and condensers, all interwoven with piping. This is a departure from the usual practice of using the frame of the building in supporting or connecting the apparatus installed within. It certainly has distinct advantages of flexibility and affords some unusual margins of safety. Here, too, is one of the earliest American synthetic ammonia plants of which they are justly proud in Niagara Falls.

One of the newer plants at Niagara Falls, is the Niacet Chemicals Corporation. Erected in 1925 to manufacture aldehydes from acetylene for use in rubber accelerators, acetic acid has become now their chief product. Acetylene to acetaldehyde, and from this well known starting point for synthesis to acetic acid, acetaldol, acetin and diacetin, the various acetates, crotonaldehyde, paraldehyde, and a constantly growing list of closely chemically related products, is the chemistry of this enterprise.

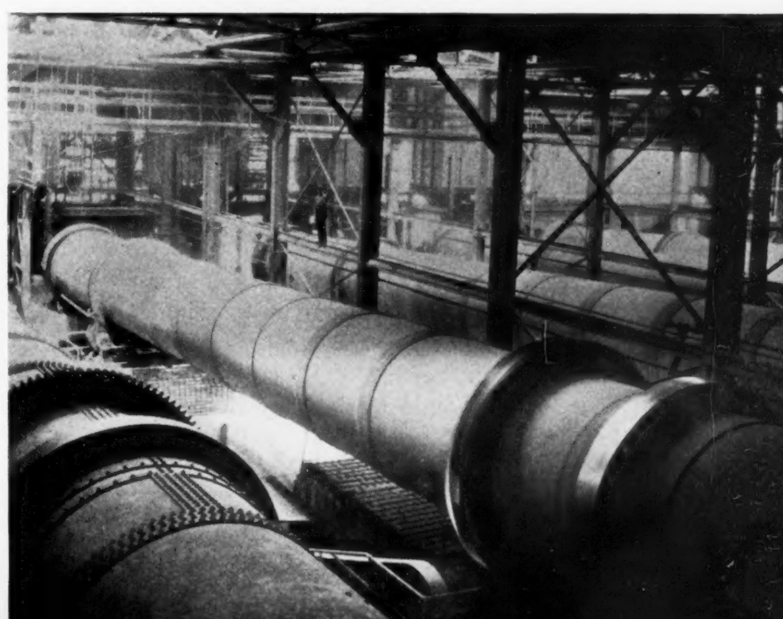
When this plant was quite new—in 1928 I had visited it—and calling again on Waldo C. Hovey, the general manager and C. J. Herrly, the sales manager, I found them in familiar offices; but O. C. Thompson, the plant superintendent, and A. M. Matheson, the chief chemist, are now lords over much greater bailiwicks, for both plant and laboratory have grown greatly. I was just at the right time, too, to be one of the first visitors to inspect the newest of all additions to this operation, a new semi-scale experimental plant into which are now being transplanted the results of a lot of careful research just ready to fruit in new products. Several of these are destined to become industrial specialties of the same commercial class as their synthetic tannin agent, "Fastan," furnishing additional evidence of the growing fondness among the chemical manufacturers for this type of merchandising. Over 90 per cent. of the Niacet raw materials is still acetylene, so that the record of seven new products marketed during the past two years and six other new ones ready for commercial exploitation is impressive demonstration of what an intensive cultivation of the commercial possibilities of a single, promising chemical material may accomplish.

From this lusty youngster among the Niagara plants I went back to two of the great oldsters, the industrial brothers fathered by the inventive genius of Edward G. Acheson, the Carborundum and the Acheson Graphite companies. Though the products are quite different, yet the processes are roughly similar. Clay and coke baked in great electric furnaces produce that peer of abrasives, silicon carbide. A mixture of tar and cokes subjected to a similar treatment results in artificial graphite. The further preparation of the two are as distinct as their uses.

The great battery of iron drums, holding each two tons of ground carbide, charged with nitrogen to produce calcium cyanamid.

The great chunks of sparkling, blue-black silicon carbide are broken up and ground down to a range of particle fineness that commonly ranges from six to six hundred mesh, though some grades are produced for very fine polishing that pass up to a 1000 mesh. These bits of abrasive become the essential ingredient in the manufacture of a long line that among the grinding wheels alone runs from tiny dental wheels to vast wood pulp grinding wheels 67 inches in diameter, 54 inches across, weighing an astonishing 17,000 pounds. These bits of carborundum are mixed with a bewildering variety of clays, cements, binders, even with phenolic resins, shellac, and rubber, and then molded or pressed or hand-formed into many shapes—wheels and discs, ovals and rods and bars—for making all sorts of whetstones, polishing tools, grinding instruments. The kilns for this baking are not only of the old familiar chamber type, which is a periodic operation, but also of the continuous tunnel type. The time of firing may vary from two days to two weeks and the

The largest installation of rotary lime kiln burners in America, at the plant of the North American Cyanamid Limited, in Niagara Falls, Ontario.



temperature ranges reach from 300-400° Fahrenheit, for such delicate materials as rubber and shellac, up to 2210-2350° F. for clays and cements.

The carbon and graphite plants of the National Carbon Company, Inc., are separated by the width of Niagara Falls, and H. T. Reid, as superintendent, is a busy man watching over both. In the carbon plant are produced not only the enormous carbon electrodes which are used in the huge furnaces at the carbide plant as well as smaller sizes that carry the power into ferro-alloy furnaces of other producers and into electric steel furnaces the country over, but also the special carbon electrodes which are taken in by the graphite plant and turned out after processing as Acheson graphite electrodes.

Three common materials—anthracite coal, petroleum coke, and pitch go to make up carbon electrodes. These materials after treatment are mixed together and then are extruded from hydraulic pressed in various forms and sizes from 1/16" to 40" in diameter and in lengths of from a few inches to fifteen feet. The "green" electrodes are then baked in huge furnaces for many days and when taken out are about ready for use as carbon electrodes or are sent to the graphite plant for graphitizing.

At the graphite plant the carbon blanks are refurnaced and by treatment at a minimum temperature of 4000° F. amorphous carbon is changed into graphitic carbon and the graphite electrodes are ready to make steel in electric furnaces or perhaps to just cross the road to become electrolytic electrodes in the mercury cells of the Mathieson Alkali Works.

Across the river, over the Canadian border, stands a vast collection of big buildings, all painted the slaty gray of a battleship, dominated by a row of six tall stacks, the plant of the American Cyanamid Company. A man is to be found here with whom the T. A. V. might very well consult. He is no "brain trusty," but he came to Niagara Falls with Carbide in 1908 and crossed the river to the only operating cyanamid plant in the American hemisphere in 1913. He labored some sixteen hours a day for seven months to build the famous cyanamid plant at Muscle Shoals. He is operating every day the two biggest electric carbide furnaces on the American continent.

Naturally he was curious for any scrap of news about the new developments down at the Shoals, and a few words about my visit there last summer started him reminiscing about herculean labors that erected that plant in the midst of the hurly-burly of the war when, as he put it, "We waded knee-deep through Alabama mud and Government red tape."

"And were we proud of the results?" he continued, as we walked across from the office to the power plant. "In record time we had put up the biggest lime kilns, the longest battery of air compressors, the greatest this and the grandest that of all cyanamid plants—and it worked! It would work today if they knew how to handle it. But now I'll show you a plant that has grown naturally and steadily till—Well, it's almost true that you could shove Muscle Shoals through our modern lime kilns without crowding." He winked broadly and slipping his arm through mine, added, "Joking aside, all our equipment here today is bigger and better than their biggest and best."

The cyanamid process begins in two great coke driers and seven gigantic rotary lime kilns. The coke is dried by air in compartments, with a special air cell center, designed by this same George Cox who has adapted the same devices in the lime coolers. Coke and lime are fused in four electric furnaces to calcium carbide. Two of these furnaces consume 15,000 h.p. and the two new ones, the Titans of their kind, consume just twice this power load, 30,000 h.p. The carbide is ground and packed in iron drums holding two tons each, and these are fitted with a carbon electrode and a pipe through which nitrogen is fed slowly once the charge is heated. This charging, which continues from two to three days, sets up the reaction CaC_2 plus N_2 equals CaCN and C. The nitrogen is stripped off from liquid air, a portion of the operation which has recently been improved by the installation of seven new nitrogen columns of 1200 cm. capacity. The solid caked mass from the curing pots is broken up and powdered, sprayed with water to remove any uncombined carbide, and packed in bags for use as direct fertilizer or shipped in bulk as an ingredient for the fertilizer mixers.

As we walked back to the office through the yard of that great gray, well-kept plant in the gray twilight of a winter's afternoon, Mr. Cox urged on me, "Come up again and stay longer; and next time stop over here and try our Canadian hospitality." If it is any better than the best that was provided me "over on the American side," he extended a very large invitation.

Industry's Bookshelf

Our New Federal Taxes, by John C. Herndon, Jr., 281 pages. The John C. Winston Co., Winston Bldg., Philadelphia. $2.00.

Book makes no pretext to being a treatise on the various theories of taxation but it will show you how to pay your correct tax—but no more. Considering the fast-mounting array of taxes the book should be extremely popular and save the buyer of the book many times the cost of the initial investment.

Nitrocellulose Ester Lacquers, by Dr. Fritz Zimmer, 246 pages. D. Van Nostrand Co., 250 4th ave., N. Y. City. $7.00.

The author is recognized in Germany as the outstanding authority in the nitrocellulose lacquer field and was asked to contribute this monograph to the "Chemie und Technik der Gegenwart" series of Dr. Walter Roth, of Köthen. It is a very practical book treating of the origin, preparation and application of lacquers and will prove invaluable to those engaged in the industry. The author is thoroughly acquainted with American methods but the book essentially gives the German industry viewpoint.

Nitre Cake

By F. D. Hartford

NITRE cake, acid sodium sulfate, or sodium bisulfate, as it is variously called, is a by-product of making nitric acid from sulfuric acid and Chile saltpetre or synthetic nitre. The production of nitric acid early became centered in sulfuric acid plants, not only because its manufacture required a supply of sulfuric acid, but also because nitric acid itself could serve the sulfuric acid chamber process better than plain nitre.

However, since nitric acid's partner, nitre cake, had only a restricted market, many schemes to utilize the surplus within the chemical plant were advanced. The most successful was in connection with the muriatic-salt cake process which customarily required sulfuric acid and common salt. The acid of the nitre cake was used to replace some of the liquid sulfuric acid which would otherwise have been necessary and its sodium sulfate content was merely added to the salt cake produced by the reaction.

Thus, nitre cake is tied as to place of production, quantity of production, and price to its four teammates —sulfuric, nitric, and muriatic acids, and salt cake.

The present conventional nitric acid-nitre cake unit in the United States consists of a vertical cast iron pot and cover set in a brick firebox; a train of silicon-iron bleachers and S-pipe condensers, some of which are water-cooled; and sewer pipe towers containing vitrified packing over which water or weak acid trickles. The life of the cast iron pot is a principal item of plant investment. These pots vary in size from the customary six foot diameter by six feet deep to the eight foot diameter by nine feet nine inches deep as used in war-time nitric plants. The average thickness of the metal at the bottom is two and one-half inches and on the sides not less than one inch. To minimize the chance of cracking, the bottom is made hemispherical and good foundry practice in casting requires molding with the top up to insure the soundest metal in the bottom. The inner part of the pot mold is suspended in order to avoid the use of chaplets which would form a potential source of leaks.

The nozzle at the bottom for draining the molten nitre cake is horizontal and extends slightly beyond the furnace brickwork. Its internal diameter should never be less than three inches, nor should the thickness of metal of the nozzle invert be less than three inches to allow for the scouring action of the molten cake. This outlet nozzle is usually closed with a blind flange held on with bolts. This flange is sometimes suspended by a chain so that when it is unbolted and knocked loose from the nozzle it will swing away from the stream of hot cake. Another type is a flange held in place by a latch that is remotely controlled. Tapping the nitre cake is a dangerous operation and, in addition to a reliable closing device, every other reasonable safeguard of runways, tools, and goggles should be given the operators.

The top of the pot is customarily made with a flange for bolting on the cover casting. This cover casting contains the openings for the nitric gas outlet, the sulfuric acid inlet, the combination manhole and nitre inlet, and the pyrometer tube opening. The cover casting is made dome shaped and since the sulfuric acid inlet corrodes rather rapidly, it is sometimes placed in the manhole cover so that it can be cheaply renewed. If the flange joint between pot and cover is not machined, then both flanges should have a deep recess for calking in asbestos rope, but machined flanges are well worth their added cost from the standpoint of uninterrupted operation. The gas outlet is usually lined with a silicon iron sleeve extending below the inner surface of the cover so that any condensed nitric acid flowing back from the bleachers cannot cut away the cast iron.

Since the optimum rate of reaction in the pot depends on temperature, an indicating pyrometer visible from the furnace floor is essential if the operator is intelligently to regulate his fire. A recording pyrometer gives the superintendent also a picture of the entire operation.

The necessity for a firebox under the pot brings the nitre cake outlet from five to seven feet above the plant floor level. From this elevation the molten nitre cake is conveyed in portable steel troughs down to steel plate pans set on the floor. These pans (ten to fifteen feet square and six to eighteen inches deep) are sometimes built with bottom projections so that the solidified cake may be more readily barred up. Or, pieces of

railroad rail may be set into the molten cake end up and then later sledged free thus helping to break up the cake. The pans should be protected from rain by a shed roof, otherwise weak acid, formed with the remnants of nitre cake inevitably left in the pans, will cause corrosion of the steel.

Customary operation calls for one part of 96 per cent. nitre to 1.1 parts of 66° sulfuric acid. The nitre is put into the pot first, then the manhole cover is placed and sealed with fireclay mud. The cold acid is allowed to run in and the fire is started. An excess of acid is used to make the nitre cake fluid enough to drain completely from the pot. The temperature is gradually raised in about four hours to 500-600° F. Too rapid temperature increase causes foaming in the pot and an excessive evolution of gas. Too strong heating decomposes some of the nitric acid and causes the familiar red fumes at the outlet stack.

After eight to ten hours, when all the nitric acid gas has come off, the cake is tapped off into the pans and hardened. After cooling, the cake, which is a yellowish white, is broken with hammers into chunks readily handled or shoveled. It may be shipped either in lumps as it comes from the pans, or in granular form—about 10 mesh—produced by passing the lumps through a swing hammer pulverizer.

The average yield of acid is about 92 per cent. of the theoretical, one hundred pounds of 96 per cent. nitre giving 65 pounds of 100 per cent. acid. The yield of nitre cake is about 140 pounds per 100 pounds of nitre charged.

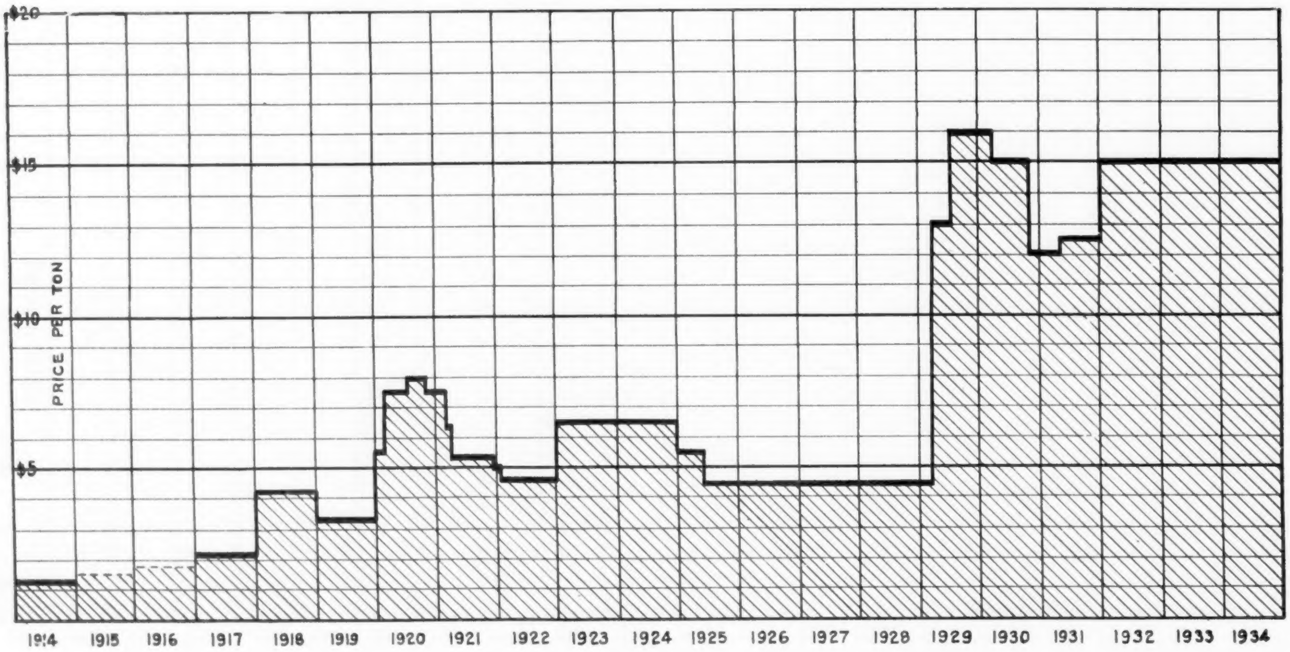
Nitre cake soon attracts moisture and becomes covered with a highly acidulous and slimy film that makes it dangerous to operators and destructive to equipment. Because of its destructive character, the cake is usually stored in vitrified brick bins.

The tapping of molten nitre cake from the pot is a precarious operation at best and has resulted in many cases of severe injury to plant men. One method of treatment of the injured parts employs a minimum of dressing and the exposure of the wounds to direct sunlight. Splashes of the molten cake into the eyes may readily cause blindness. Operators should be protected by goggles, aprons, and gloves, and, in addition, should be fully instructed as to the dangers involved. The men who break up the cake should be protected by goggles as the flying particles are very likely to get into their eyes causing great discomfiture at the least, and sometimes severe injury.

Uses of Nitre Cake

Nitre cake has two distinct fields of use; one, wherein its sulfuric acid content is utilized, the other wherein its sodium sulfide is made available. An instance of the first case is the pickling of steel where the bath is kept at the proper acidity by successive additions of cake. An example of the second use is the manufacture of sodium sulfide. Here the acid content of the nitre cake is wasted up the chimney, frequently to the detriment of all steel structures in the vicinity.

Nitre cake's most economical utilization, of course, is in the muriatic-salt cake process previously mentioned. The preliminary product of the muriatic furnace with a plain acid and salt feed is likewise acid sodium sulfate so that, theoretically, muriatic acid could be made with a straight nitre cake and salt feed. However, the practical difficulties of mixing and heating the materials to produce a cake of uniform composition are too great to make such a process economical.



VARIATIONS IN PRICES OF NITRE CAKE 1914 - 1934

One of the principal uses of nitre cake is in the smelting of Canadian nickel-copper matte. The matte, which contains 80 per cent. nickel and copper and 20 per cent. sulfur, is thus deficient in the latter element to form the metallic sulfides. For this reason nitre cake is preferred to normal sodium sulfate. Thousands of tons of nitre cake are imported into Canada for this purpose. A competitor for this use is natural sodium sulfate available in Saskatchewan. This sodium sulfate is readily converted into nitre cake with sulfuric acid.

The difference in price which usually exists between nitre cake and salt cake have led to many attempts to extract the sodium sulfate without resorting to the reactions of nitre cake in some chemical process. The most promising of these schemes, and one for which a number of patents have been issued, provides for the cooling to a very low temperature of an aqueous solution of nitre cake. A granular sodium sulfate readily separates out.

Prices and Markets

Since nitre cake is valuable either for its sulfuric acid or for its sodium sulfate content, its price must parallel somewhat the prices of those two commodities. For example, if it is used simply for its acid, as it is with certain textile manufacturing processes or for galvanizing, then the price will be about one-third of the commercial acid corresponding to an acid content of about 35 per cent. The solid form of nitre cake, in contrast to the liquid acid, gives it some advantage in handling, storing and dissolving. When used for its sodium sulfate then the price must be less than two-thirds of the price for salt cake, modified, of course, by freight handicaps and the anxiety of producers to unload their nitre cake.

The chart showing the variations in the wholesale carload prices in New York should not be taken too seriously. For example, the average quotations in New York are now $15 per ton. Actual sales may run anywhere from $11.50 to $16. Producers remote from customers may quote as low as $3 a ton f. o. b. works. Indeed, nitre cake is frequently a sort of step-child that its owners are glad to get rid of at any price—a relationship not unrecognized by promoters of processes that require cheap acid or sulfate.

During the World War enormous stocks of nitre cake were accumulated, quotations became largely fictitious, and quantities were flushed down the sewers. Had the Government war-time plants operated at full capacity, the resulting avalanche of nitre cake dumped into the water courses nearby would have introduced an extremely serious problem of stream pollution.

Although nitre cake is perhaps not so essential to industry as sodium sulfate or sulfuric acid, nevertheless, the United States and Canada find it convenient to consume in a normal year not less than 200,000 tons. However, the tonnage of nitre cake made from nitre and sulfuric acid is pretty certain to decrease as nitric acid produced so cheaply by synthetic processes increases.

Industry's Bookshelf

Alchemy, Child of Greek Philosophy, by Arthur John Hopkins, 262 pages. Columbia University Press, $3.50.

You need not agree with the explanation of the philosophy of alchemy set forth in this well written and well printed book to enjoy thoroughly the story of the rise and fall of the pseudo-science that sired chemistry. So thoroughly steeped in alchemical lore is the author that his account is rich and full-flavored far beyond the average dry chronicles, and he makes a conscientious effort to fit alchemy into its proper place in the thought both of the ancient and the medieval worlds and to interpret its meaning in contemporary terms which, after all, is the only way to appraise the value of an idea which for many centuries exerted a real force in the best thought of the world.

Money, by Elgin Groseclose, 304 pages. University of Oklahoma Press, $3.

"A survey of monetary experience" the conclusion of which is that mankind has yet to learn the first lessons in the control of money and that many of our most forbidding problems today are the result of our almost universal misconception of what money is and how it should be used. The story of money from earliest times is vividly told in a most interesting style, and the moral is that not money but debt is the root of all evil.

Jons Jacob Berzelius: Autobiographical Notes, translated by Olof Larsell, 194 pages. Williams & Wilkins, $2.50.

The sketch of his own life as one of the requirements of membership in the Swedish Academy of Sciences is a forthright account of events with few details of his scientific investigations and only hints of his mental life. Yet the book is a first-class contribution to scientific history and it is valuable to have it available in English.

Economic Planning and the Tariff, by James G. Smith, 330 pages. Princeton University Press, $3.00.

Free trade ala mode, a lightly but surely written book that proves to the author's obvious satisfaction that tariffs are terrible and economic planning worse. Good reading with a fat appendix of all the laws and statistics needed to turn the whole argument inside out again.

The Financiers and the Nation, by Rt. Hon. Thomas Johnston, 206 pages. Methuen (London), 5s.

A shocking book which reveals that the solid and substantial structure of British finance and industry harbors its own crooks and grafters. Its record of swindles and frauds is highly entertaining, if depressing; while the imposing roll of mistakes and misjudgments of the mighty inner circle of England's banking oligarchy needs no added argument to demonstrate that finance, during the past two decades, has very generally rendered real dis-service to industry.

Labor's Fight for Power, by George E. Sokolsky, 275 pages. Doubleday, Doran. $2.

A deep-cutting analysis of the ideals and programs of the various organized labor movements in the United States, and a clear account of the struggle for industrial and political power that is being waged by the A. F. L. The more one knows of the labor problems the truer the examination will appear, and Sokolsky's generalizations should be very thoroughly mastered by anyone who wants to understand the political and social forces at large today. A good book to put on your "must" list.

Electrons (+ and —), by Robert A. Millikan, 492 pages. University of Chicago Press. $3.50.

"Required reading" for anyone who graduated before 1925, a simple yet thoroughly sound explanation of the latest knowledge of physical science.

Expanding the Sulfur Market Through Research

By W. E. Ball

Investigator, Crop Protection Institute

UNOBTRUSIVELY, but effectively, the leading American sulfur producers are investigating possible new uses for sulfur. There is little of the spectacular in their programs, but definite indications point to increased consumption as a result of these investigations. Of special promise is the control of weeds in grain and other crops, along irrigation ditches and roadsides.

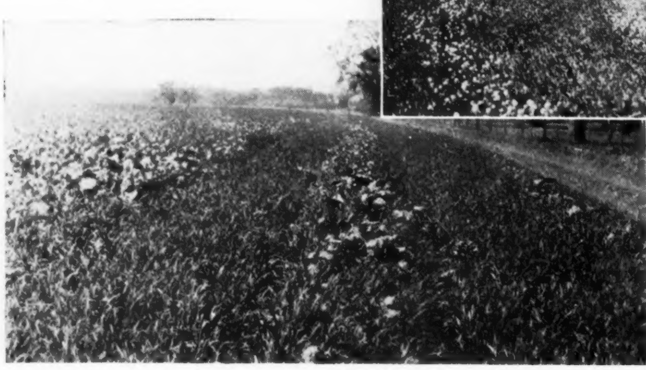
The value of dilute sulfuric acid for this purpose has been clearly demonstrated in Europe, particularly in France and England and the use is growing rapidly. The acid manufacturers in France reported the sale of 70,000 tons for this purpose in 1933, as against 27,000 tons two years earlier. Last year in England 20,000 acres of grain fields were sprayed, whereas only a few hundred acres were sprayed on an experimental basis during 1932. In Canada the National Research Council is actively investigating this weed control method and similar developments are under way in the wheat growing areas of the Argentine.

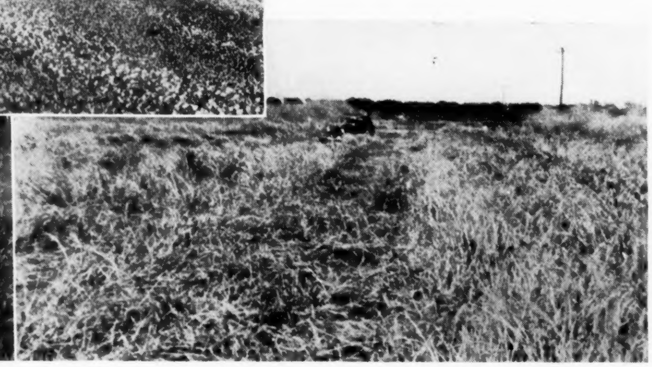
In this country California offers the immediate opportunity to establish this new outlet for acid. In that state 800,000 acres of barley alone are grown each year, representing for this one crop a potential market for 40,000 tons of acid in California. Roughly estimating three tons of acid for one ton of sulfur, this would indicate a newly created market for 13,000 tons of sulfur. Adoption of this weed control method in California on anything like the scale on which it is practiced in France would mean an increase in domestic consumption of sulfur of between 2 per cent. and 3 per cent. This is by no means an ultimate figure but it indicates how promising the outlook is. While California promises to lead the way, if the other grain growing districts adopt the idea, an increase of 10 per cent. over 1933 sulfur consumption figures could be called a reasonable estimate.

The California experimental and demonstrational work is being carried on by the California Agricultural Experiment Station at the University Farm at Davis and by the California Department of Agriculture, under a fellowship established by the Crop Protection Institute with funds supplied by the Freeport Sulphur Company. In general, the work has consisted of spraying mustard infested barley fields with dilute sulfuric acid. One-twentieth acre strips were used; the acid was applied through a six-foot boom at 75 pounds pressure per square inch by means of an all bronze plunger-type pump. Concentrations of acid varying from 5 to 15 per cent. by weight and volumes of solution varying

Figure 1, center. Strip sprayed with dilute sulfuric acid in mustard-infested barley, showing blooming mustard. Figure 2, below. Mustard-infested wheat ten days after spraying.

Figure 3, below. Effect of dilute sulfuric acid in preventing the lodging of grain. The sprayed areas have remained erect.





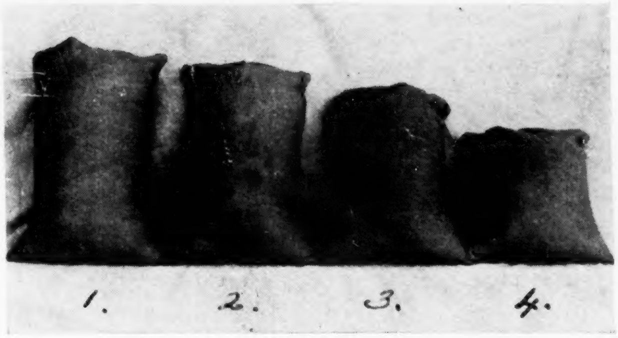


Figure 4. Results of harvest on one series of tests.

from 80 to 160 gallons per acre were used in the experiments. Each experiment was repeated five times, and for harvest determinations ten square yard samples were taken from each treated strip. On approximately 200 plots an average of 95 per cent. of the mustard and wild radish plants were killed. Figures 1 and 2 picture the thoroughness of this type of treatment. The blooming mustard is shown in the white strips in Figure 1. The accompanying table gives the results obtained from a series of plots on the El Dorado Ranch near Knights Landing, California.

Figure 4 shows the harvest results from the El Dorado Ranch. Sack No. 1 represents the 150 square yard samples taken from 10 per cent. treatments; No. 2, the 150 square yard samples from 7.5 per cent. treatments; No. 3, the 150 square yard samples from 5 per cent. treatments; No. 4, the 150 square yard samples taken from the untreated strips.

TABLE I

Barley plots

Treatment	Per cent. H_2SO_4 by wt.	Approx. volume per acre gallons	Yield of grain in kilos. per 10 sq. yds.	Lbs. of grain per acre	Wt. of grain in lbs. per bushel	Bushels of grain per acre	% increase in yield of grain
1	5	80	2.384	2543.11	41.33	61.53	28.72
2	5	120	2.390	2549.51	42.43	60.10	29.16
3	5	160	2.922	3117.01	42.98	72.52	57.77*
4	7.5	80	2.576	2747.92	42.47	64.70	39.09
5	7.5	120	2.816	3003.94	43.10	69.69	52.05*
6	7.5	160	3.128	3336.76	44.70	74.65	68.89*
7	10	80	2.992	3191.69	45.03	70.88	61.56*
8	10	120	2.974	3172.48	44.40	71.45	60.58*
9	10	160	2.980	3178.88	44.63	71.23	60.91*
10	..	..	1.478	1576.64	41.20	38.27	
11	..	..	1.944	2073.74	41.90	49.49	
12	..	..	2.134	2276.42	42.37	53.73	

Nos. 10, 11, 12 unsprayed areas; the average of the three was used as a basis for comparison.
.6629 kilograms per 10 sq. yds. = difference required for significance.
* Significant increase in yield.

With destruction of weeds comes the additional advantage at harvest time of upright grain. Where grain has a tendency to lodge or fall with wind and rain, the sprayed areas exert a greater resistance to these elements. This fact alone often means the difference between a profit and a loss on a crop of grain. This characteristic is shown in Figure 3, the sprayed strips having remained standing while the unsprayed strips lodged.

Possibilities of using dilute sulfuric acid in controlling weeds on roadsides, ditch banks, fence lines, etc., have been studied by Streets and Brown in Arizona who found sulfuric acid effective on a great number of weeds, both annual and perennial, to the extent of killing top growth. Whereas they relied upon high pressures to cause a thorough wetting, other workers are using "wetting agents" or "spreaders" to bring about the same effect.

The University of California plans to use a large commercial type sprayer for the coming season, to determine more accurately the cost of application, and also to carry on more demonstrations in grain-growing areas. A new method of applying the acid, which is described in "*Agricultural Engineering Journal*," December, 1934, is to be used during the 1935 season. It is interesting to point out that in the use of this method the farmer is not required to purchase a new sprayer, as it is only necessary to make an inexpensive addition to his present spraying apparatus. Such spraying with acid is economically sound. There are indications that the use of acid on roadsides will be as effective as oil, and if so, it is cheaper. In California alone, in 1933, 9,000 miles of highways were sprayed with oil. Based upon last year's prices for grain crops, the increased yields caused by the spraying of the fields (as high as 68 per cent.) more than paid for the cost of applying the acid.

At least for the present, many farmers will not, or cannot, undertake to do their own spraying. In order to establish this new outlet for acid in England, the National Sulphuric Acid Association, Ltd., organized a division to do contract spraying. No similar organization exists in this country but it is the intention of the Freeport Sulphur Company to see to it that such a service organization is established.

Toxicity of Gases

Prof. John C. Olsen, Polytechnic Institute of Brooklyn, is conducting exhaustive researches on the toxicity of gases generated when fires occur. He has constructed a special combustion chamber on the Hackensack, N. J., meadows. Plant managers and others will be interested in the conclusions reached on the relative powers of various gases to produce death in a short time together with the percentages by volume in the air required to produce this effect on animals: 1—hydrogen sulfide .06 to 3%; 2—hydrocyanic acid, .048%; 3—nitrogen oxide, 07%; 4—sulfur dioxide, 2%; 5—carbon monoxide, .5 to 1.0%; 6—ammonia, .5 to 1.0%; 7—gasoline, 2.4%; 8—carbon dioxide, 12 to 30%.

Liquid Copper

Announcement of the discovery of a new chemical process for reducing elemental copper to a form whereby it may be applied, 98.3% pure, as a liquid to any surface, is made by Nichols Copper. A special vehicle for the copper has also been developed. The copper in powder form, and sufficiently fine to penetrate a 350-mesh screen, remains in suspension in the vehicle and is said to approach a semi-colloidal state. Applied to any surface, it affords complete coverage, the form of the minute particles preventing the appearance of minute gaps in the coating. Two graduate scientists have been secretly at work on the problem for nearly 8 years and after repeated trials, have finally produced the copper in the form required for application and mixing with the vehicle. The copper is not an oxide nor a bronze powder, and tests have shown that it should have a useful life under actual service 5 to 10 years, or longer.

Budget Control

By V. R. Bechtel

Budget Director, American Cyanamid Company

III

Summary of Budget Operation

A JOB order system is used in controlling outlays of major character such as for new construction, major repairs or replacement, purchase of property or assets of an outside company, advertising programs regular and special, unusual development work, studies looking toward engaging in new activities, etc. This is an extremely important part of the responsibility of the Budget Committee, also of all major executives. It is through this door that all changes from a normal operating program enter. It is through this door that the cash created from public or private financing, from earnings and building up of reserves, either flows out into expansion of plants and facilities, into major rebuilding and maintenance work, or is allowed to accumulate in the treasury as additional protection to working capital position or is made available for distribution to stockholders in form of dividends.

To our company, this phase of the business has been particularly important during the past five years. The main expansion program of our company started in 1928 and 1929. Each unit acquired was desired to fit into the picture for specific reasons and to realize these purposes, large amounts of cash were necessary to expand or relocate production facilities, to introduce more modern production methods and to install new and improved processes. In some instances, it was essential and possible to fit this program into the space of a few months. In others, it has been advisable and necessary to plan the fixed capital program over a period of years even up to five or more years.

Acquisition of certain units has given rise to the advisability of acquiring others in related fields to round out the line and to secure important benefits in operating economies. A great deal of cash has been required for these purposes also. This growing and consolidating program has continued up to this date, absorbing the greater part of cash accumulations. The successful development of a company under such a program builds earning power and competitive strength which improves the value of the stockholders' equity and in time brings its reward in cash returns.

When funds are desired for a purpose beyond the regular operating program covered by the operating budgets along lines recounted herein, specific requests for appropriations are prepared and presented to the Budget Committee. These requests originate with the department head or executive responsible for the activity in which a change or addition necessitating substantial cash outlay is desired. The proposal must be made in writing, setting forth all the facts and reasons for making the outlay.

The proposal report requests an appropriation be made in a stated amount which is supported by an estimate prepared in detail. The greater number of requests are naturally for new additions, improvements or major repairs to plant facilities. The estimates are therefore usually prepared by the Production or Engineering Departments showing the estimated cost in detail for each item (to which an item number is assigned) separated as to labor, stores, purchases, overhead, engineering and in total. Each account class of construction is separately totaled as buildings, equipment, machinery, etc.

The proposal report must supply the following facts insofar as they apply to the specific request.

1. What are present facilities—why are they inadequate?
2. What products are affected and how?
3. What are the commercial reasons for proceeding with the outlay? A summary of sales volume by years, unit and dollar sales, cost of sales and gross profit showing how each will be affected with and without the outlay, is to be included in the proposal. If a new product or an expansion of an old one, a sales survey should accompany or be a part of the proposal.
4. Dollars to be saved and/or profits anticipated are to be estimated, stating same before and after depreciation on the new investment.
5. Any other important reasons for making the appropriation are to be stated.

6. The probable life of the property being acquired is to be estimated and the originator of the proposal is to set forth his views on the depreciation and/or obsolescence policy which the nature and use of the asset justifies.
7. Description and values of property to be retired (if any) are to be supplied.
8. A list of items on hand with gross and net book value which can be used in the job are to be included with a brief history and an appraised value of the usable worth of each item as part of the new asset being created. These values are to be part of the total funds requested, although a separation is to be made of values of items now on hand from items which require cash outlay.

Requests for appropriations are passed through the regular organization channels for review, recommendations and approval to the Budget Committee through the Budget Director's office. All requests having to do with new products, new processes, etc. are referred to the Development and Patent Committees for review and approval or recommendations. The Budget Director reviews all requests and checks all data submitted for accuracy and completeness, makes certain that all necessary reviews and approvals are secured, after which the request is presented to the Budget Committee for consideration. In some instances, requests involve problems and special considerations with which members of the Budget Committee are not entirely familiar. On these and other important problems, the Budget Committee secures the opinion and advice of some person or persons who are fully familiar with the type of problem involved. Usually such persons are found within our own organization. The Committee also frequently requests the sponsors of a proposal to sit in at a Committee Meeting to discuss the request in detail to develop facts which may not be fully covered or entirely clear from the written proposal.

The decision of the Committee is conveyed to the requestor in writing by the Budget Director stating the reasons fully where requests are not approved. Complete records of the Committee's action on all requests are recorded in the Committee's Minute Book, copy of which is circularized to major executives of the company who are not members of the Budget Committee. On those approved, job order numbers are assigned and job orders are written in the Budget Director's office except in cases of large operating units which assign and write their own job orders supplying a copy to the Budget Director. The job order as written summarizes the entire request concisely but completely, including a summary of the estimated cost. The estimate summary is supported by a detail estimate sheet. The job order shows the name of the requestor, approval by the major executive in charge, by the Budget Director and by the Chairman of the Budget Committee. The accounting distribution is approved by the Treasurer's Department and copies of the completed job orders are sent to all parties concerned with the original and supporting papers retained in the Budget Director's files.

At the end of each month there is prepared for each plant or unit a job order statement showing the amount spent to date and committed for against each appropriation and when completed, a

JOB ORDER

REQUEST AND AUTHORITY FOR EXPENDITURE

DATE ______ 193_

NO. ______

COMPANY ______ PLANT OFFICE DEPT. ______ AMOUNT $ ______

GOF 3006-REV. 5M 8-34. HJL.

A—STATE PRESENT FACILITIES—WHY INADEQUATE.
B—PRODUCTS AFFECTED.
C—COMMERCIAL REASONS

D—CAPACITY AVAILABLE—REQUIRED.
E—SAVINGS—BASIS PAST AV. AND BUDGET.
F—ALL OTHER PROSPECTIVE RESULTS.

TO BUDGET COMMITTEE:

AUTHORITY IS REQUESTED TO MAKE EXPENDITURES DESCRIBED BELOW AND IN ATTACHED PAPERS IN AMOUNTS SHOWN.

GENERAL DESCRIPTION:

Summarized from proposal report prepared in full detail.

RESULTS TO BE ACCOMPLISHED AND SAVINGS TO BE EFFECTED:

Same as above.

EST. LIFE AND ACCOUNT TREATMENT RECOMMENDED:

Recommendations of engineering, production or other department requesting the appropriation. Final decision made by Treasurer's Department and shown below.

DESCRIPTION AND VALUES TO BE RETIRED:

Summarized from proposal report.

SUMMARY OF ESTIMATE ITEM	LABOR	STORES	PURCHASES	TOTAL CASH	MAT. ON HAND	OVERHEAD	ENGINEERING	TOTAL
Summarized from detail estimate sheet, copy of which is attached to each copy of job order.								

REQUESTED BY ______ DATE ______ EST. DATE TO START: ______ EST. TIME TO COMPLETE: ______

APPROVED ______ EXECUTIVE IN CHARGE DATE ______ BUDGET DIRECTOR DATE ______ CHAIRMAN BUDGET COMMITTEE DATE

COPIES TO: DETAIL COSTS UNDER JOB NO. ______ BY ITEMS NOS. ______ TO ______ INC.

CHARGE TO:

WRITE OFF OR DEPRECIATE:

DISTRIBUTION APPROVED ______ ASST. TREAS.

CLOSED ______ 193
TOT. COST
EST. COST
OVER $
UNDER $
OVER %
UNDER %

closing notice is provided showing comparison of actual against estimated costs in detail. It is the responsibility of the requestor, working jointly with the person carrying out the work, to keep the cost as low as possible and within the appropriation. When overruns become apparent, a request is to be made for additional funds following through the same channels as with the original request prior to making commitments beyond the amount appropriated.

No additions to a fixed capital account, deferments of major repairs, or charges against specific reserves provided for intermittent repairs and maintenance are permitted except through job order authority. Separate series of job order numbers are provided for different operating units and a confidential series covers projects which from their nature require limited distribution of copies.

From this recount of procedure it may seem that a great deal of unnecessary red tape and delay must be waded through before getting projects under way. That is not the case. In very few proposals do we find that proper checks and consideration can be given without an orderly development of a project on paper. Putting a proposal on paper and securing the advice and experience of others often results in constructive improvements with the result that when finally ready for presentation, the request is on quite a different basis than it would have been presented when the proposer was sufficiently sold on the idea to proceed if funds had been readily available. In cases of emergency, consideration and approval can be secured to fair sized projects as quickly as the emergency demands. The paper work must follow in such cases promptly and the emergency decision is confirmed in the usual manner.

There are many instances where proposals are for good reasons not acted on promptly. The project may be too costly, may not indicate adequate returns on the outlay, may require more capital than is considered wise for a particular item or at a particular time when many other projects are under way, may tie in with some other program which has not yet fully developed or may involve some patent structure which must be thoroughly checked.

It is quite surprising how many dollars can be saved sometimes by declining to appropriate funds on the basis of cost estimates being too high for a specific request. If the proposal is important and much desired by the proposer, ways will usually be found to materially reduce the cost and still do a satisfactory job.

Funds saved on one job order can in no way be used for other purposes or to offset overruns on other job orders. The same general procedure is followed on appropriation requests other than for plant property items which are covered by job orders. The job order authority establishes an effective control of outlays, provides a sure way of knowing that review and approval has been given by persons who have a direct responsibility to make good on the outlay or whose activities are indirectly affected by the program proposed, also provides a convenient method of accumulating accurate costs in the accounts.

Sulfur Recovery from Flue Gases

A paper recently read before a joint meeting of the British Institute of Fuel and the Institution of Electrical Engineers describes the Howden-I. C. I. non-effluent water system for flue-gas cleaning. A pilot plant, working this process has been in continuous operation at I. C. I.'s Billingham plant for nearly 2 years.

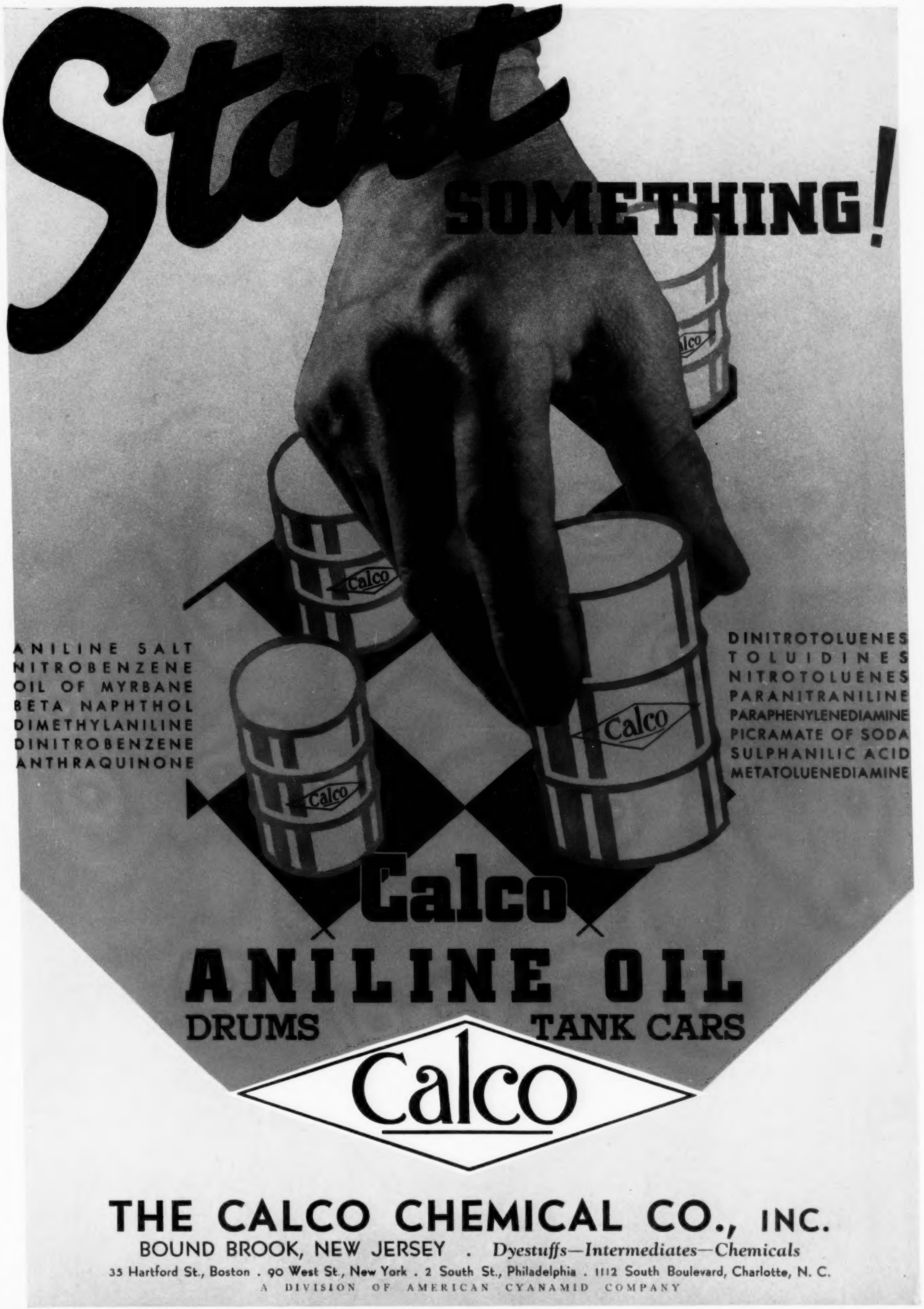
In most civilized countries, said the authors, there are already many exacting restrictions concerning the discharge of effluent into water courses. Tendency to increase the scope of the restrictions is apparent almost everywhere, and as far as any effluent from the wet washing of flue gases is concerned, it can be anticipated that restrictions will in the main become prohibitions, at least in the larger cities. To be of universal application, therefore, the wet washing system demanded is one in which there is no liquor effluent. This means a recirculating, non-effluent water system, from which the grit, dust, and acids can be separated and removed as solids.

Grit and dust will be scrubbed out of flue gases by the recirculated water, which will be treated with some form of alkali for the purpose of scrubbing out and "fixing" the "acids." Since the solids must be separated from the circulating liquor in the system, the question arises as to whether it should be possible to provide the required form of non-effluent water system, as one producing some saleable by-product, whereby the power station or other engineer could obtain a credit for settling against his charges for dust and acid removal. An answer to this question might influence the kind of alkali to be used in certain countries.

Various possibilities have been considered in this connection. None showed sufficient promise to warrant detailed investigation. It can safely be postulated that for the time being the universally acceptable system should be based on the discard of the solids and not on attempts to work them, and the SO_2 they contain, up into normal commercial products. This may perhaps be better appreciated after reflection upon the major factors involved—viz.: (i) Any by-products would be of the type having a low market price level, and therefore inconsistent with high conversion or capital charges. This applies irrespective of whether individual or collective production is considered. (ii) An extraneous organization for production, packing, distribution, and sales, with types of labor, technique, outlook and problem, each different from that now associated with power stations, would be required.

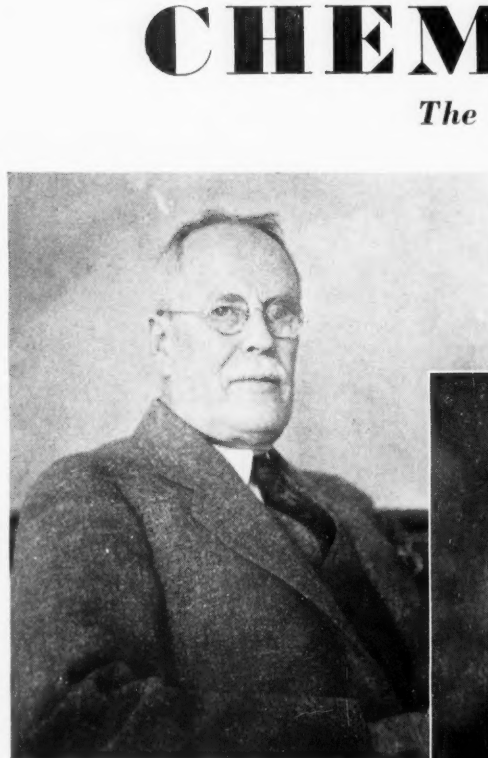
What is likely to appeal most to the engineer in the new plant is the extremely small "scrubbing volume" which has been used to give a very high performance with a very small pressure drop, and which constitutes but a minor fraction of the total volume of the scrubber. The grid packing, in the form adopted, is a contributory factor to the high performance, but there are other factors, some of which are of equal importance—*e.g.*, liquor distribution, liquor spread, liquor rate, and gas rate.

The grid packed scrubber, as described, may be used for the removal of fine dust from any gas permitting a wet process to be used. It is being used, for example, for the removal of a fine soluble dust from the exit gases of a rotary salt drier working on fertilizers, the gas and liquor flows in this case being counter-current, for ease of installation. Practically the same apparatus that is being used for cleaning boiler flue gases can be used for cleaning cement kiln gases, the alkali consumption then being negligible owing to the lime and chalk content of the dust. The pilot plant has now been transferred for trial on this duty.—British *Chemical Trade Journal*, Jan. 25, p62.


Start SOMETHING!
ANILINE SALT
NITROBENZENE
OIL OF MYRBANE
BETA NAPHTHOL
DIMETHYLANILINE
DINITROBENZENE
ANTHRAQUINONE
DINITROTOLUENES
TOLUIDINES
NITROTOLUENES
PARANITRANILINE
PARAPHENYLENEDIAMINE
PICRAMATE OF SODA
SULPHANILIC ACID
METATOLUENEDIAMINE
Calco
Calco
Calco
Calco
Calco
ANILINE OIL
DRUMS
TANK CARS
Calco
THE CALCO CHEMICAL CO., INC.
BOUND BROOK, NEW JERSEY . Dyestuffs—Intermediates—Chemicals
35 Hartford St., Boston . 90 West St., New York . 2 South St., Philadelphia . 1112 South Boulevard, Charlotte, N. C.
A DIVISION OF AMERICAN CYANAMID COMPANY

CHEMICAL

The Photographic Record



Below, Percy C. Kingsbury, as Chief Engineer of the General Ceramics Company, has been responsible for a large number of the innovations and developments in chemical stoneware.

The success of any chemical operation is dependent upon the type and efficiency of the equipment used, and chemical plant and administrative executives are becoming acquainted with an ever increasing number of executives of the equipment companies. Three outstanding men in this field are shown here. Above, James E. Moul, General Manager, Turbo Mixing Corporation, who is also well known as President of the Chemical Engineering Equipment Institute. Right, F. J. Stokes, President, F. J. Stokes Machine Company, a veteran manufacturer of vacuum pumps, mixers, condensers, stills, and other specialized equipment used in the chemical and allied fields.

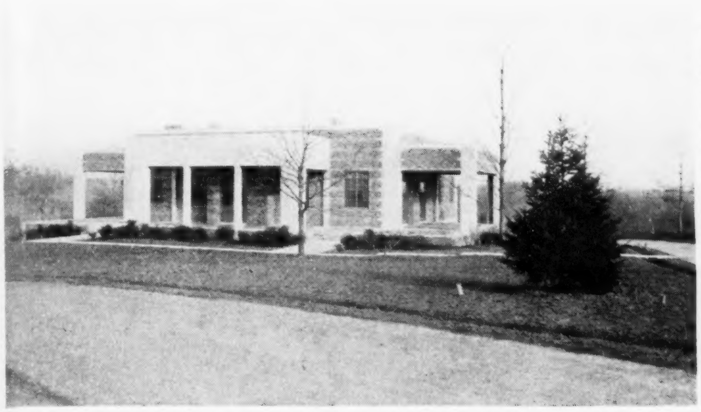
Keystone View Company

A large part of India's salt industry; hills of salt at Maurypur (Sind), India, awaiting shipment. Photograph made at the Grax, Ltd., salt works, thirteen miles west of Karachi.

Below: The semi-works laboratory at the Dow Chemical Company is a building just recently completed, in which Dow is carrying on operations on a semi-works scale, with the view of making the journey from the test-tube to the tank-car swifter, simpler, and surer for the new chemical products they are developing.

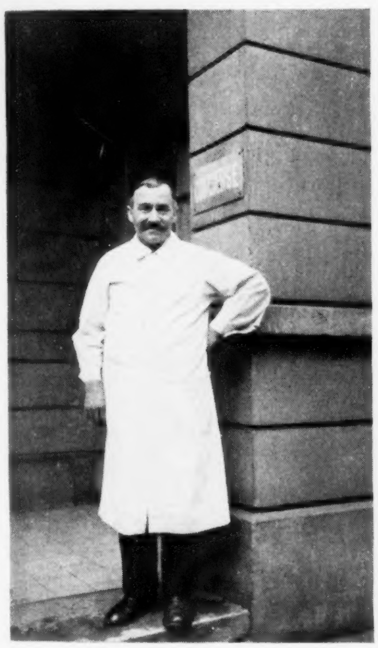
NEWS REEL

of Our Chemical Activities



The new cafeteria-clubhouse at Hercules Experiment Station, Hercules, Del. Has large clubroom, modern electrically equipped kitchen, large dining-room, lockers and card-rooms. For outdoor recreation, there are two tennis courts.

Professor Charles A. Kraus, Director of Chemical Research, Brown University, who was awarded the Willard Gibbs Medal, for his work in electrolysis.



Joseph Meister, who as a boy of nine on July 6, 1885, was bitten by a mad dog and taken the next day to Pasteur. (See "The Life of Pasteur," by R. Vallery-Radot, Doubleday, Page & Co., 1923, p.414.) This photograph was taken by Dr. Harrison E. Howe at the Pasteur Institute in May 1932. Meister now occupies the post of porter or concierge at the institute.

Courtesy Monsanto "Current Events"

Two interior views of the new Monsanto Administration Building at St. Louis. Above, reception room outside President's office. Portrait of the founder of the company, John F. Queeny, hangs on the back wall. Left, the Board of Directors' room, the walls of which are entirely covered by a map of the world done in oil.

New Products and Processes

A Digest of the Current Literature for the User of Chemicals

New Paint and Varnish Solvent

Decahydronaphthalene has for long been known to possess unique properties, which make it of special value as a solvent and thinner in the paint and varnish industry, but the prohibitive price of the imported product hitherto available has stood in the way of any extensive use of it for this purpose in England. Considerable importance must, therefore, attach to the announcement that Imperial Chemical Industries Ltd. have recently put into operation a new process for the manufacture of decahydronaphthalene, made possible by an important extension of hydrogenation technique at their Billingham factory.

This abstract from *Synthetic and Applied Finishes* describes decahydronaphthalene ($C_{10}H_{18}$) as the fully-hydrogenated form of naphthalene, and as now manufactured is a water-white liquid of exceptional purity, with a pleasant terpene-like odor, not unlike that of turpentine. Its general properties, together with much valuable specialized data relevant to its uses in the paint and varnish industry, are fully summarized in an informative booklet recently published, following the new development. The comparative data given in its pages serve to show that it is not on the score of price alone (for it is now considerably cheaper than turpentine) that it may be used with advantage to replace turpentine as a paint thinner, and also, in many cases, the most costly solvents which are today becoming increasingly employed. Such intrinsic properties as a very high flash-point, leading to a reduction of the fire risks normally run with the more usual thinner, an absence of toxicity shown by prolonged tests and practical use; and a solvent power of exceptional range where paint and varnish materials are concerned, are claimed for it by the manufacturers.

"Dec" is stated to give stable solutions with a variety of driers, notably with cobalt linoleate, which is often unstable in white spirit solution. Its general solvency is illustrated in a number of comparative tables, in which the solubilities in "Dec" of a large range of natural and synthetic waxes, bitumens and glyptal type resins are set out against the corresponding values for turpentine and Roumanian white spirit. It is interesting to note that the "Kauri-Butanol" test shows it is slightly superior to turpentine in solvent power. The limits of its miscibility with ethyl alcohol and methanol are clearly shown in the two solubility diagrams given for the systems "Dec"-anhydrous ethyl alcohol-water, and "Dec"-methanol-water, respectively.

Other informative sets of comparative figures are given in respect of the drying times of "Dec" when compounded with a number of different types of paints and varnishes. It is pointed out in this connection that while the evaporation rate of this product *per se* is comparatively low, the ultimate drying time of paints and varnishes is substantially unaffected, while examples are cited in which this is actually more rapid than with turpentine or white spirit.

It is further claimed that the film properties and flow of paints and varnishes containing it are superior to those of the corresponding mixtures with turpentine or white spirit. Greater abrasion resistance has been demonstrated by the Air Ministry "scratch test," and such defects as wrinkling, silking and webbing, especially of varnishes, are stated to be reduced by its use. Small amounts are also stated to improve the brushing properties of paints which otherwise would have poor flow, and white paints thinned with it are claimed to give no discoloration with metallic driers. In its anti-skinning properties, and in respect of such requirements as hiding power and gloss, it is fully the equal of turpentine, and it has no lifting or softening effect on the undercoat.

If the data given are to be relied on (and they have been substantiated by investigations, which are still proceeding, in the laboratories of the Research Association of British Paint, Colour and Varnish Manufacturers), it is obvious that a new solvent of first importance in the paint and varnish trades has made its appearance.

Paint and Varnish

A varnish, claimed to be completely resistant to concentrated and diluted hydrochloric and sulfuric acids, and also to concentrated and dilute alkalies, is being marketed under the name Detel Varnish. *The Chemical Trade Journal* (London) also reports a second product made by the same firm known as Detel Red which, on application with a brush or spray, dries quickly to a hard adherent coat. This paint is claimed to be unaffected by hydrochloric, sulfuric, nitric and chromic acids, by caustic soda or ammonia, by mineral oils, alcohol, and the majority of chemical solutions. The material is non-inflammable when dry, and is said to be an excellent electrical insulator.

Metals and Alloys

The world's purest sample of iron has been prepared in the metals research laboratory of the Carnegie Institute of Technology. Studies of this sample, it is hoped, will clear up problems which have baffled the steel industry for more than a century and lead to improved manufacturing processes and products.

Aluminum-Nickel Alloy

After 12 years of research and development, engineers of International Nickel Company have produced a new type of Monel Metal which combines the strength of alloy steels with the corrosion resistance of regular Monel Metal. This new alloy, known as K Monel, was announced at the recent meeting of the American Institute of Mining and Metallurgical Engineers by Dr. W. A. Mudge, metallurgist of the Huntington, W. Va., works of the company where it was perfected. In

analysis the new alloy is practically the same as regular Monel Metal with the exception of about 4% added aluminum and fractional amounts of other elements. It is readily heat treated and its fully hardened condition shows Brinell values above 350, though it is available also in softer forms. Its tensile strength runs higher than 160,000 lbs. a sq. inch.

Glass and Ceramics

The answer to every manufacturer's hope—a better product at a lower unit cost—is announced for the enameling industry in a new and basically different process, developed through the joint efforts of Dr. J. E. Rosenberg, director of research, O. Hommel Co., Pittsburgh, and William J. Baldwin, incumbent of the industrial fellowship established by the company at Mellon. Result of process is a new type of porcelain enamel product to be known as "Hommelaya." Patents have been granted or are pending here and in foreign countries.

Glass from By-Products of Coal

Glass made from by-products of coal is undergoing tests by the Research Department of the British Air Ministry. Substance is as clear and transparent as glass, but considerably lighter, and unbreakable. *The Glass Industry* states that if the Air Ministry is satisfied with the tests it may be used in airplanes.

Soda-Lime-Alumina Glass Properties

A report upon some properties of glasses containing soda, lime and alumina is contained in Technical News Bulletin No. 213 (January, 1935), issued by the Bureau of Standards. Accompanying the report is a table showing the refractivity, density, softening temperature and coefficients of expansion of two types of glasses in which alumina, lime or soda replace silica. *The American Glass Review*, in summarizing the conclusion reached, says that it is evident that alumina produces the least change in refractivity and density, lime produces the greatest change, and soda is intermediate between lime and alumina in its effect. Similarly, alumina produces the least change in coefficient of expansion, but soda produces the greatest change, with lime intermediate. Lime and alumina produce about the same increase in softening temperature, while soda decreases the softening temperature.

Coatings

An adherent coating of a metal, an alloy, a metal oxide, or a metallic compound such as a glass, glaze, or enamel, is formed on the surface of a vitreous body such as glass or a vitrified body such as vitrified porcelain by projecting the metal, etc., *e.g.*, by the Schoop process, onto the body, the body having previously been tempered by rapid cooling from a temperature adjacent its softening point and then re-heated, preferably to between 200 and 400° C. Alternately the deposition of the coating may be effected during the cooling, after the body has been brought to a temperature below the lower limit of relaxation of the internal stresses. The coating of rough, polished, or molded glass with metals such as silver, aluminum, zinc, copper, or brass is referred to. *The Chemical Age*. Spec. 413,900 of Soc. Anon. des Manufactures des Glaces et Produits Chimiques.

Grease-Proof Packing for Containers

A new grease-proof packing whose special feature is the chemical treatment of the inside wall of the box or cardboard case or paper bag is described in *The Packing Gazette* (Dec., '34). The insides are covered with a layer of latex and casein. As soon as this has dried a second layer of gelatine is applied in the usual manner, and made insoluble with formaldehyde.

Iodized Wrappers for Fruit

Possibility of using iodized wrappings for fruit when being stored is being investigated at the Low Temperature Research Station, Cambridge, England. Wrappers are made by treating tissue paper with a definite volume of iodine solution—a covering 25 cm. sq. contains approximately 30 mgm. of free iodine. Laboratory tests, according to *The Chemical Trade Journal* (London), show that storage rots of fruit can be considerably reduced by this kind of wrapping, while the appearance and ripening of most varieties is not impaired.

Rubber

The rubber industry in Malaya is greatly interested in recent successful experiments in rubber powder for manufacturing purposes and high hopes are entertained for a new, simple, and cheap process. The first process on the plantation produced a fine granular form of rubber almost comparable with whitewood sawdust in appearance, this result being produced on an extremely simple machine; within a few moments of the arrival at the estate factory, the liquid latex can be converted into this stable form. *Chemistry and Industry* report that one company has tested equipment in Amsterdam on a large scale and this has been used for experiments with ammoniated liquid latex shipped from the East. For the first time latex direct from the tappers' buckets was used to feed the equipment. Tests proved that powders of all grades from coarse granular to fine dust could be produced.

New Anti-Oxidants and Accelerators

R. T. Vanderbilt Co.'s "Age-Rite HP" is a special anti-oxidant developed for protection against flex-cracking, heat deterioration, reversion, and static oxidation.

Naugatuck Chemical's "M-U-F" is an antioxidant particularly recommended where discoloration of whites is a problem.

Du Pont's rubber chemicals division announces "Zenite" (zinc salt of mercaptobenzothiazole), a new all-purpose accelerator. Modifications are offered, containing an activator and a scorching inhibitor, one suggested for use in rubber stocks heavily loaded with clay and carbon black, the other for pure gum stocks loaded with non-re-inforcing fillers.

Powdered Rubber

Unusual interest is being displayed in the new rubber powder developed by Heveatex Corp. of Melrose, Mass. This powder may be obtained in any formulation suitable for numerous purposes, such as direct molding without the necessity of mastication, etc. No. 58 has been developed for hard rubber molding and No. 194-G is a substantially pure rubber powder.

Latex-Impregnated Paper Fibers

Rubber may be incorporated with paper fibers by three processes to give a homogeneous rubber-fiber sheet formation. These three basic processes, capable of many variations, are: 1. incorporation of rubber prior to sheet formation; 2. incorporation during sheet formation; and 3. incorporation of rubber after sheet formation. These methods and the results obtained are carefully explained in a paper "The Application of Latex to Paper Fibers," by H. B. Townsend, in the February issue of *The Rubber Age*. The current developments of latex are also reviewed, and the last paragraphs are devoted to the suitability of rubber as a sizing medium.

Textiles

A new and inexpensive chemical process of setting free the fibers of flax may bring about a revival in flax growing in this country after nearly a century of dormancy. Howard D. Salins, of Chicago, foresees the establishment of an American linen industry and says that with his secret chemical formula, the gummy substance that holds the fibers of flax together can be removed within two hours, while it takes two months under the dew-retting process in general use in Europe and Canada.

Mildew Agent

Shirlan D is a du Pont product developed for the mildewproofing of textile fibers and fabrics. It is non-toxic and may be used without damage on fabrics that are to be subsequently handled. Furthermore, it is an insoluble but readily dispersible powder and because of its insolubility, it is not easily removed from a fabric by weathering. It may be applied directly to yarns or fabrics or may be added to sizing mixtures with which the yarns or fabrics are to be sized.

Wetting Agents

Valuable wetting agents, particularly suitable for use in mercerizing lyes, are said to be produced by acting with carbon disulfide, advantageously with the addition of an alkali hydroxide, on aliphatic secondary amines, of which one alkyl group contains a chain of at least three carbon atoms and the other may have any number of carbon atoms and may be linked, for example, with a further alkyl amine residue. The amides of dithiocarbonic acid thus formed have an excellent wetting effect in strong alkali lyes, are very resistant towards alkaline solutions and foam only to a small degree.

The wetting effect may be increased by adding solvents, or other substances which are *per se* difficulty soluble in strong alkaline lyes, since these amides of dithiocarbonic acid are distinguished by a good dissolving or dispersing power for the additional substances just mentioned. On the other hand, the addition of well-known dispersing agents, such as phenols, sulfurized phenols or highly sulphonated oils may be of advantage in many cases.

Example: crude cotton is treated with a mercerizing lye of 28-32° Bé., containing 1% of a product which has been prepared as follows: to 100 parts by weight of di-*n*-propylamine, 200 parts by weight of a caustic soda lye of 300° Bé. and 80 parts by weight of carbon disulfide are added, and when the reaction is complete the excess of carbon disulfide is removed. B. P. 410, 164. *The Dyer and Textile Printer.*

Month's New Dyes

General Dyestuff releases include Fastusol Orange LGG, for which is claimed exceptional fastness to light also very good levelling and solubility. Chiefly suited for the dyeing of cotton and other vegetable fibers, as well as rayon for curtains and upholstery materials. Celliton Discharge Blue 3R, the first blue dyestuff for acetate silk dischargeable to a pure white, which gives the possibility to build up dischargeable browns, navies, greens, and blacks. Naphtol AS-L4G, which with suitable Fast Color Salts produces extremely bright greenish yellows of a fastness to light which is even better than that of Vat yellows; the combinations, furthermore, possess the valuable feature of being white dischargeable. Also of interest for naphtholate printing. Fastusol Orange F3G, a straight, direct color of a very bright yellowish orange shade, said to level well and to dye cotton and viscose the same shade and leave acetate silk clean. Variamine Blue Salt BA and Variamine Blue Salt RTA, which differ from the old brands Variamine Blue Salt B and RT, by not containing any alkali binding agent. It has been found that in all introduced application methods of these products such additions can be eliminated. A new circular has been issued on Eulan N which gives all the points in the method of application, based on practical experience, of this chemical which has been proven to produce the safest and most durable mothproofing on all kinds of woolen goods. Fastusol Yellow L5GA, the greenest and brightest shade of all direct dyeing colors. Well suited for cotton-silk unions and leaves acetate silk white. Celliton Fast Brown 5R, a new homogeneous brown for acetate silk. Fast to light, washing, acid and alkali. Levels well and discharges to a clear white.

Miscellaneous

The influence of magnesium sulfate on the deterioration of chestnut and quebracho leathers was studied by R. C. Bowker, E. L. Wallace, and J. R. Kanagy and incorporated in a paper issued by the official journal of the Leather Chemists Association. Samples of both leathers, which contained varying percentages of sulfuric acid and comparable leathers which contained similar amounts of sulfuric acid and approximately 5% of magnesium sulfate were examined. The addition of magnesium sulfate caused an increase in the pH of the leathers. Deterioration was determined by measuring the change in strength after 6, 12, 18 and 24 months. Deterioration of the samples aged for 24 was also determined by measuring the extractable nitrogen. The results by both physical and chemical methods show that, for the same percentage of acid, the leathers containing magnesium sulfate deteriorated less. However, it was found that deterioration was a function of pH rather than of actual acid content. All leathers below pH 2.8 showed serious deterioration while the percentage of acid required to cause it varied from .75 to 1.75%.

Haglund Bisulfite Paper Process

The process invented by Gustaf Haglund, and put into practice at the Lillestrones pulp works in Norway is said to be highly successful. Cooking is in two phases. First, the fragments of cut wood are treated with a solution of bisulfite containing no free SO_2. By this means the SO_2 is fixed on the fibre without provoking deincrustation. Second, the quantity of SO_2 necessary for delignification is added and cooking continues in the ordinary manner. Process is especially serviceable for wood with a high content of rosin and the pine cellulose obtained is of the first quality. The ether extract is not more than 0.2 per cent. A detail of the method is the preparation of the lye from an initial solution of sulfate of soda. Cellulose yield is claimed to be higher than in the ordinary processes.—*Zellstoff und Papier.*

Hydrogen Peroxide as Agricultural Disinfectant

Tests on hydrogen peroxide as a seed disinfectant have been carried out by J. Kisser and L. Portheim of the biological research station of the Vienna Academy of Science. Instead of using the usual poisonous disinfectants, such as mercury, arsenic and copper compounds, a 30% solution of technical hydrogen peroxide, stabilized by about .1% of mineral acid was used. In the case of beans, peas, soya beans and vetch the peroxide treatment acted as an efficient disinfectant. Uncertain results were obtained with cabbage, cauliflower, spinach and turnips.

Road-Tar

The governor of the world's largest gas-distributing enterprise, located in England, recently announced that shortly there would be placed on the market a special tar, which is said to be harmless to fish life, and is the result of experiments in cooperation with the Ministry of Agriculture and Fisheries to deal with the problem of roads draining into fishing streams and polluting them.

Booklets and Catalogs

Chemicals

A1. "Bakelite Varnish Enamel Lacquer Cement." The Bakelite Corp., 247 Park ave., N. Y. City. This booklet deals with 4 classes of Bakelite products—varnish, enamel, lacquer, and cement. These materials are described with reference to their properties, uses, and methods of application. The varnish, enamel, lacquer and cement described in this booklet are all of the heat-hardenable type; that is, requiring baking to bring out their best properties.

A2. "Dictionary of Fertilizer Materials." The Barrett Co., 40 Rector st., N. Y. City. A most comprehensive listing and authoritative description of the products and terms used in the fertilizer industry.

A3. "Concerning VereBest Photographic Chemicals." H. O. Bodine Associates, Inc., Wantagh, L. I., N. Y. A catalog and price list.

A4. "The Canadian Market." Toronto Industrial Commission, Toronto, Can. An analysis showing that one-third of the country's buying power is concentrated within 100 miles of Toronto. Executives with Canadian plants or considering one will find this booklet helpful.

A5. "Alcohol Talks." Commercial Solvents Corp., Terre Haute, Ind. The February issue of this interesting monthly bulletin is devoted to "The Grass That is Cane." It is a most instructive story on sugar and what modern chemistry has meant to that industry.

A6. "The Plants and Products of Commercial Solvents Corp." Terre Haute, Ind. A beautifully illustrated brochure showing the various plants, together with a brief summary of the operations carried on at each factory. A list of the Corporation's products is presented; the facilities for distribution are shown, and attention is called to Ajax alcohol anti-freeze. Booklet, designed primarily for distribution to stockholders, is of general interest to all users of solvents.

A7. "High and Low Records of Fats, Oils and By-Products." The Davidson Commission Co., 327 S. LaSalle st., Chicago. Each year this useful compilation is made up in booklet form.

A8. "Solvents, Plasticizers." E. I. du Pont de Nemours & Co., Wilmington, Del. This new booklet describes the physical and chemical characteristics of a number of comparatively new solvents and plasticizers, several of which are newcomers in this country.

A9. "The Givaudanian." Givaudan-Delawanna, Inc., 80 5th ave., N. Y. City. Beginning with the January issue the Industrial Aromatics Division will issue monthly, an exclusive booklet devoted to odor problems in the soap, cosmetic, disinfectant, paper, rubber industries, etc. This department will be glad to arrange for you to receive it regularly.

A10. "Chromated Zinc Chloride." Grasselli Chemical Co., Cleveland, Ohio. Describes an improved wood preservative. A very important announcement and a booklet that should be in the hands of all concerned with wood preservation problems.

A11. "January-February Catalogue." Magnus, Magee & Reynard, 32 Cliff st., N. Y. City.

A12. "Mallinckrodt Chemicals." Mallinckrodt Chemical Wks., St. Louis. The February price list.

A13. "Merck Chemicals." Merck & Co., Rahway, N. J. March price list.

A14. "Monsanto Current Events." Monsanto Chemical Co., St. Louis. February issue contains several interesting articles, including "Modern Soap Industry Made Possible by Advances in Chemical Control," by S. Bayard Colgate, president, Colgate, Palmolive, Peet; the story of laying power lines underneath the Mississippi, connecting the Monsanto plants; views of the new administration building just completed; and a historical article on the Ruabon, North Wales plant.

A15. "Spraysene." Sherwood Petroleum Co., Bush Terminal Bldg., No. 1. Describes a new scientific insecticide base free from the unpleasant kerosene odor.

A16. "Oil Proof Synthetic Rubber." The Thiokol Corp., Yardville (Trenton), N. J. New leaflet describes oil proof synthetic rubber, its grades, properties, etc.

A17. "An Oil Proof Rubber Cement." Thiokol Corp. Booklet describes an oil proof rubber cement, properties, uses, users, etc.

A18. "The Pioneer." Electro Bleaching Gas Co., 9 E. 41 st., N. Y. City. If you are an alkali user or a buyer of chlorine, or interested in the new carbonate of potash you will find a steady diet of the "Pioneer" worth while. Let this Department arrange this.

A19. "Witcombings." Wishnick-Tumpeer, Inc., 251 Front st., N. Y. City. The February issue of this entertaining as well as instructive house organ contains the announcement that a "Witco" dustless carbon black has been added to the W-T line. If you use industrial chemicals, you will be welcomed into the "Witcombings" fold and this Department will be glad to do it for you.

Equipment

A20. "The Aluminum News Letter." Aluminum Co. of America, Pittsburgh, Pa. The current issue of "Aluminum News Letter" (February) contains the 2nd instalment of the "Story of Aluminum." It makes most interesting reading.

A21. "Lithoform." American Chemical Paint Co., Ambler, Pa. New booklet describes a new product that is used of galvanized iron to insure paint adhesion.

A22. "Bailey Feed Water Regulators (Bulletin No. 83)." Bailey Meter Co., 1050 Ivanhoe Road, Cleveland, Ohio. This bulletin, which deals with thermo-hydraulic feed water regulators, lists distinctive features, diagrammatically illustrates the principle of operation by the thermo-hydraulic generator, and describes Bailey regulating valves of both tight seating and sleeve type construction. Data on Bailey excess pressure valves are also included. A tabulation of valve dimensions and a partial list of users complete the bulletin.

A23. C. O. Bartlett & Snow Co., Cleveland, Ohio. Bulletin No. 74, "Chains, Sprockets, Buckets," is available for distribution. Standard types of detachable, pintle, ley bushed, combination, drag, roller, transfer, steel bushed and drop forged chain and chain attachments are illustrated, and the dimensions, weights, working loads and prices are given for each size. Eighteen pages are devoted to listings of prices and weights of Sprocket Wheels. Desirable information is given with regard to sizes, prices, etc., of shafting, collars, takeups, elevator buckets, and spur, miter, girt and bevel gears.

A24. "Water Stills." The Barnstead Still and Sterilizer Co., 21 Lanesville Terrace, Forest Hills, Boston, Mass. Company has just published a new illustrated bulletin describing the operation and exclusive features of Barnstead Water Stills of single, double and triple types made in a full range of sizes to furnish from ½ gallon to 5,000 gals. per day. These stills are made for laboratory and industrial service and may be heated by steam, gas or electricity.

A25. "The Charlotte Colloid Mill." Chemicolloid Laboratories, Inc., 44 Whitehall st., N. Y. City. This is the most complete catalog ever assembled by this well-known maker of colloid mills and represents the results of some 10 years of steady effort in designing and laboratory-field operations. All models are adequately described in blueprint and other manner and also included are the lists of products upon which it successfully operates. Every one in the process industries will find this booklet a necessary adjunct of the technical library.

A26. George D. Feidt & Co., 5th at Buttonwood sts., Philadelphia, Pa. This pioneer house in the laboratory supply field has expanded its new Filter Paper Dept., to include a new group of domestic grades known as "Efanco." A descriptive pamphlet and price list is available.

A27. "Trip-Free Air Circuit Breakers." General Electric Co., Schenectady, N. Y. Gea-1662A is a 4-page descriptive pamphlet.

A28. "H-O-H Lighthouse." D. W. Haering & Co., Inc., 3408 Munroe st., Chicago. If you are dealing with or responsible for industrial water problems you should receive this twice-the-month bulletin regularly. This Department will arrange for you to do so.

A29. "Reducing Your Operating Costs." The Hill Manufacturing Co., 370 Lexington ave., N. Y. City. Describes how the Hill Improved Float Type Non-Condensable gas separator will reduce power and ammonia costs in the operation of refrigeration systems.

A30. "Koven Industrial Equipment." L. O. Koven & Brother, Inc., 154 Ogden ave., Jersey City, N. J. A new 52-page catalog outlining in detail the extensive services rendered by L. O. Koven & Bro., Inc., to the industrial field. Illustrated with hundreds of examples of the equipment designed by Koven engineers in co-operation with their clients, this catalog covers the entire range of plate and sheet metal construction in all commercial metals and methods of construction. Among the individual sections making up the catalog are: 1. Tanks for Process and Storage. 2. Equipment for the Chemical and Allied Industries. 3. Mixers. 4. Equipment for Food Industries. 5. Equipment for Machinery, Metal Product Plants, Public Utilities, Railroads, etc. 6. Containers. 7. Sinks and Tables. 8. Misc. Plate and Sheet Metal Construction, including chutes, hoppers, piping, stacks, etc. 9. Marine Equipment. 10. Built-up Welded Construction.

A31. "Link Belt News." Link Belt Co., 910 S. Michigan ave., Chicago, Ill. Those in charge of handling problems and general plant equipment should be regular readers of this new monthly house organ for it contains each issue a wealth of practical data.

A32. "World's Largest Plant Mill and Its Products." Lukens Steel Co., Coatesville, Pa. A 8-page graphic story of the wide variety of products made by this company, a number of them belong to the chemical or chemical process industries.

A33. "Carbon Monoxide-The Killer." Mine Safety Appliance Co., Pittsburgh, Pa. The immediate need is for rapid and widespread dissemination of clean-cut information on the habits and toxic effects of carbon monoxide; and on the equipment developed severally to detect its presence, protect the individual and resuscitate the victim. All of that information is available under one cover in this publication prepared by Mine Safety Appliances—internationally recognized as an authority on respiratory protective equipment, and manufacturer of a comprehensive line of approved carbon monoxide protective apparatus.

A34. "The Reichert Universal Camera Microscope MeF." Pfaltz & Bauer, Inc., 300 Pearl st., N. Y. City. Describes a revolutionary method and apparatus for microscopic work and photomicrography.

A35. "Enduro 18-8." Republic Steel Corp., Massillon, Ohio. A brand new booklet contains latest authentic data on the various members of the Enduro 18-8 family of stainless steels. Information is included on the following: Enduro 18-8, Enduro 18-8-S, Enduro 18-8-STi, Enduro 18-8-SMO, Enduro 18-8-B and Enduro 18-8-FM. An important feature of this 16-page, illustrated booklet is a table showing the degree of corrosion-resistance exerted by Enduro stainless steel, Types 18-8, S and AA in the presence of several hundred individual chemicals, solutions and other reagents.

A36. Mixer Bulletin No. 32-D. Robinson Manufacturing Co., Muncy, Pa. This is without doubt one of the most complete catalogs on mixing equipment that has come to the attention of this Department and should be in the technical library of every plant, plant manager, consultant and chemical engineer.

A37. "Hardening and Drawing Furnaces." Surface Combustion Corp., Toledo, Ohio. A 4-page circular.

A38. "Lubrication." The Texas Co., Dept., PP2, 135 E. 42 st., N. Y. City. Plant executives and operators alike will find this booklet crammed full of interesting and valuable data.

A39. "Flexlock Rubber Joints." The U. S. Stoneware Co., 50 Church st., N. Y. City. According to the announcement, the patented "Flexlock Rubber Joint" is the final answer to the problem of making a perfect and economical joint between 2 pieces of chemical stoneware. This item and a number of other new ones are listed in the new catalog pages just released by this company.

Containers, Packaging Equipment

A40. "Bagology." Chase Bag Co., 250 W. 57th st., N. Y. City. We can imagine many a weary executive obtaining a few minutes of complete relaxation each month reading this unusual house organ and its array of "different" stories.

A41. "The S & S Packer and Weigher." Stokes & Smith Co., 4905 Summerdale ave., Philadelphia. A brand new leaflet describes a brand new machine for intensive packing and accurate weighing of powders or granulars in packages up to 25 lbs. It is designed particularly for arsenate of lead and other insecticides, chemicals, fertilizers and many other materials.

Chemical Industries,
New York City.
25 Spruce Street,

I would like to receive the following booklets; specify by number: ....

....

Name ....
Title ....
Company ....
Address ....

Plant Operation and Control

A Digest of the Current Literature for Makers of Chemicals

Our Knowledge of Rosin

By E. A. Georgi*

Although the use of naval stores is recorded as early as 500 B. C., the American industry did not begin until 1600. This early industry concerned itself mainly with the manufacture of tar, pitch, and turpentine.

From 1700 to 1900 the methods used to produce naval stores changed but little. Process consisted of slashing the pine tree and collecting the gum-dip or oleoresin. Nothing was known at this time of different methods of slashing or the effect of different types of cuts. It remained for the Dept. of Agriculture and Miss Eloise Gerry of Forest Products Laboratory to show the effect of different methods of collecting gum-dip. To manufacture rosin from oleoresin turpentine was distilled from it in a copper retort while a small stream of water was added; the rosin remained in the retort. Some rosin was made by dry distillation of the gum-dip, but since this rosin was of poor grade the method soon disappeared. Also during this early period the rosin was run off into nearby ponds. There was no market. During the period 1900 to '20, much of this rosin was "mined."

In the past, the gum rosin industry has been handicapped by a lack of technical control. By adequate control a standard uniform grade of rosin can be produced. More progressive producers have effected minor improvements in that they now classify collections of oleoresins. This is important. The earliest collections of gum-dip (in a season) always produce the lightest grade of rosin. A few producers recognizing that temperature plays an important part have introduced thermometric control. Recently, a movement has been started among gum-dip producers for centralized refining.

In 1909 when it was thought that a shortage of virgin pine forest threatened, H. T. Yaryan disclosed the steam and solvent process which produces naval stores from waste pine. This was the beginning of the wood naval stores industry. Stumps and top wood are collected, the wood hogged and shredded and then steamed for turpentine. After this it is extracted with gasoline and the solution distilled. Pine oil and rosin are recovered.

Present rosins are best studied by comparing properties and tests used to measure these properties. There are 2 properties which immediately strike the prospective user, color and cleanliness. Gum rosins, because of their method of production, generally contain more dirt than do wood rosins. Gum rosins vary greatly in dirt content, foreign rosins being no better. Color or rosin is an all-important property since this property, in conjunction with cleanliness, forms the basis of the selling price. At present, color is usually measured in 1 of 2 ways. A cube of rosin may be compared to a government standard, or the rosin poured into a mold and the color measured with the aid of Lovibond color glasses. Of the 2 methods, the 2nd is to be preferred but is a long way from being perfect. Recently Brice, Dept. of Agriculture, has published several papers regarding the development of a photoelectric colorimeter and also a proposed modification of present government color standards which would call for a more uniform change between grades.

Next properties to consider are melting point and viscosity. Melting point as determined by the ring and ball or drop test is really a measurement of temperature at which a certain viscosity is attained. Viscosity is probably of some importance in preparation of cooked size. Other properties of lesser importance, such as vapor pressure, specific heat, latent heat, vapor pressure, and density have been measured for wood rosins. Practically all properties are affected by heat, but this heat effect is of practically no importance up to 150° C. For example if molten rosin is held at 250° C. for a certain length of time, the density will increase. These changes take place with increasing rapidity as the temperature is raised. These changes may be due to 3 causes: loss of volatile constituents, internal chemical reaction (formation of condensation products), and isomerization of acid constituents. La Land has shown that decomposition of the molecule (i. e. decarboxylation and dehydration) do not take place much under 200° C. and only extremely slowly up to nearly 300° C.

Other important properties are acid and saponification numbers. These properties give us an insight as to the relative proportions of acids, esters, and resenes present in rosin. They vary from grade to grade, but on the whole rosin can be said to be composed of approximately 85% acids, 5 of esters, and 10 of resenes. Amount of esters is calculated from the difference in acid and saponification numbers. Any errors in these determinations will most probably be in the determination of saponification number, since certain esters of the rosin acids are very difficultly saponified. Recently we have developed a new method of saponification using sodium methylate as a saponifying agent, the reaction being carried out in a neutral solvent.

At present, no methods exist for determining character and number of acids and esters in the rosin. Likewise, no methods exist which will tell us the nature of the resenes. It is known that they are unsaponifiable and that in certain rosins at least the major portion are higher hydrocarbons of the paraffin type.

Other tests sometimes included in rosin analyses are the gasoline and petroleum ether insoluble, and the unsaponifiable determination. These figures are difficult to obtain because of the great sensitiveness of the methods to external conditions. In general insoluble figures are a measure of the oxidized and unsaponifiable components present, while unsaponifiable material should closely check amount of resenes.

Crystallization is also a property of rosin. Crystallization in no way changes the chemical properties of rosin. Naturally the temperature at which a complete solution or liquid rosin is obtained is somewhat raised. We know that the tendency to crystallize becomes greater as the acid number in the rosin increases. Tendency to crystallize also increases with tempera-

* Paper delivered at the Technical Association of Pulp & Paper Industry's annual meeting, Feb. 18-21, and printed in CHEMICAL INDUSTRIES through the courtesy of *The Paper Trade Journal*. Mr. Georgi is with Hercules Powder Co.

ture, maximum crystallization being expected in the neighborhood of 90 to 120° C. depending on the rosin. A high negative rotation of the rosin indicates a greater tendency to crystallize, but cannot be relied upon as a measure of the tendency to crystallize because the rotation determined is always a composite of the rotations of the various constituents present. The optical rotation incidentally is a property which must be determined in the same manner at all times since not only the solvent but the concentration in the solvent affect the specific rotation obtained.

Considering the composition of rosin, resenes have been studied least of all. We know they consist of hydrocarbons, such as n-heptacosane and other waxy bodies. The esters present constitute only a small proportion of the total rosin. Research on composition of rosin has in the past centered around the isolation and purification of the various rosin acids. Net result of these researches are a number of materials, rosin acids. At present the literature names some 40 crystalline rosin acids, not to mention references to non-crystalline acids. Many of the investigators assumed maximum purity had been obtained because the melting point and optical rotation no longer changed on recrystallization. This fact alone does not assure maximum purity, particularly not isomeric purity. Most work has been done on abietic acid. Abietic probably does not occur in the oleoresin as such, but is the result of an isomerization process. This isomerization begins with what are termed primary acids such as l- and d-pimaric. Heat or acid causes isomerization of these primary acids (except d-pimaric) to secondary acids and these secondary acids are in turn isomerized to abietic. Abietic however, must not be considered the final isomerization product since it can be isomerized at temperatures of 200 to 300° C. to pyrobietic acids. Isomerization proceeds somewhat as follows:

Primary acids ⟶ Secondary acids ⟶ Abietic acid ⟶ Pyroabietic acids

It remained for Köhler to present the first classification of the rosin acids.

It is conceded that the isomerization process is caused by a shifting of the position of the double bonds in the rosin acid molecule from a position of higher to one of lower free energy. Abietic has been shown to be 1, 12-dimethyl-7-isopropyl decahydrophenantherene carboxylic acid. At least one other rosin acid, namely d-pimaric has been shown to have a different carbon skeleton, which accounts for its relative stability toward isomerization agents. Ratio of these different rosin acids to one another in any given grade of rosin will vary considerably because of the great number of factors affecting the isomerization as described above.

Salts of Rosin Acids

Of most importance to the paper maker is the fact that the salts of rosin acids, particularly the sodium salts, are also quite different. As an example let us consider abietic acid and its sodium salts. Abietic is the only rosin acid that we know of at present which forms a double salt, that can be isolated and crystallized. Because of the changes in rotation produced by the recrystallization of this salt, it has been postulated that other acids likewise form a double salt but so far none have been isolated. The double salt of abietic, or 3:1 salt as it is sometimes called, is extremely important in the chemistry of rosin size. Since it is composed of 1 molecule of sodium abietate and 3 molecules of abietic acid we at once say that it can be formed in any size containing free rosin. A glance at its properties in the accompanying table shows that it is certainly insoluble in practically all solvents, including water. This means that once formed it is likely to precipitate out in the form of tiny crystals. Its presence can be expected in any size containing appreciable quantities of free rosin and particularly in those made from rosins high in abietic acid content. Acid salts such as this are not uncommon; an acid laurate is described by McBain who shows that it precipitates over a wide range of concentration. The neutral salt on the other hand is soluble in water to the extent that it will form a rigid gel, but can be recrystallized from alcohol. At least one other salt, sodium d-pimirate, is so relatively insoluble in water that it can be recrystallized. This shows that a considerable difference exists among the sodium salts of different rosin acids. In rosin size therefore we are not dealing with a particular sodium salt, but a mixture depending upon the nature and composition of the original rosin used. In sizing of paper these sodium salts are converted to a complex aluminum salt, the nature of which is yet a mystery. However, it is reasonable to expect that different rosin acids will form aluminum salts having as widely different properties as the sodium salts. This may account for some of the conflicting results obtained in sizing work.

Effect of Atmospheric Oxidation

One other point remains, atmospheric oxidation. Oxidation is not uniform for different rosins and has been shown to be an auto catalytic reaction. Certain metals and ultra-violet light catalyse the reaction which centers around the double bonds. Position of the double bonds in the molecule will produce different susceptibilities to oxidation and hence various rosins oxidize with varying rates. Oils tend to increase rate of oxidation, probably because they form better catalysts for the reaction. Oxidation is particularly annoying. Decomposition of the oxidized molecule and the subsequent development of color begins to take place at 125° C. and trouble may not be detected until the rosin reaches a point in process where this temperature is attained. Reaction is accelerated by elevated temperatures. Some discoloration may be noticed in powdered rosin held at room temperature, but those color changes are probably brought on by photochemical decomposition. It is believed that saturating the double bonds will produce a non-oxidizing rosin as well as improving certain other qualities.

TABLE I

	Abietic Acid	3 : 1	Sodium Abitate
Molecular Weight	302	1230	324
Acid No.	185.6	136.7*	0
Sapon. No.	185.6	136.7*	0
Melting Point	170°–175°C.	200°–210°C.	above 360°C.
Sp. Rot. $(\alpha)_D$ 2 per cent. alcohol	—100°	—95°	—85°
Ash (Na_2CO_3)	0	4.32%	16.35%
Solubility:			
Alcohol—75 deg. C.	...	12%	16%
Alcohol—20 deg. C.	13%	5%	6%
Absolute Alcohol	16%	...	5%
Water	I	I	S
Acetone	S	S‡	I
Benzene	S	I	I
Petroleum Ether	S	I	I
Ethyl Ether	S	I†	I§
pH Aqueous Solution	...	...	8.5–9.0

* It should be mentioned there is a possibility that certain rosin acids will form acid salts of a different ratio, i.e., 1 : 1. If so the acid number would be changed accordingly.

† Aqueous ether will split the 3: 1 salt, the neutral portion going to the aqueous layer and the acid portion going to the ethereal layer.

‡ Less than 1 per cent.

§ Extracts may be obtained because of hydrolysis of the salt.

Heavy Chemicals

Calcium Chlorate By Double Decomposition

Manufacture of pure calcium chlorate by double decomposition of sodium chlorate and calcium chloride is discussed by N. A. Elmanovitch in the Journal Khim. Prom., '34, No. 4, p69-72. Eight hundred and seventy kilogs of sodium chlorate are dissolved in 428 liters of boiling water. To this solution there is added slowly a boiling solution of 450 kilogs of calcium chloride in 260 liters of water, combined solutions being then evaporated to 428 liters. The sodium chloride separates out, and is removed by centrifuging. This first fraction contains less than 1% of calcium chlorate.

Mother liquor is mixed with 100 kilogs of sodium chlorate, and agitated while hot. By centrifuging while hot, a second fraction of 118.5 kilogs of salt containing 18.8% of calcium

chlorate, 62.8% of sodium chlorate, and 18.4% of sodium chloride is obtained. Mother liquor is diluted until its density at 100° C. is 1.640, and then cooled. Salt precipitated forms a 3rd fraction (123.6 kilogs) of the following composition: 19.1% of calcium chlorate, 78.5% of sodium chlorate and 2.4% of calcium chloride.

Second and 3rd fractions of the recovered salt are added to a fresh charge in the next cycle of the process. The mother liquor from the 3rd salt fraction is evaporated until it has a density of 1.82 at 100° C., and is then cooled to 20° C. The precipitate (517.1 kilogs) contains 97.5% of dihydrated calcium chlorate; the mother liquor contains 56.8%. Sixty liters of water are evaporated from the mother liquors, and there is then added 100 kilogs of sodium chlorate, the liquor obtained being added to the filtrate from the first salt fraction.

Continuous Process in Bisulfide Manufacture

A continuous process for the manufacture of carbon bisulfide, German Patent No. 605,576, of '34, Chemische Fabrik Kalk, operates in the presence of inert and difficultly-fusible products such as bauxite and magnesia, these products serving as heat accumulators. In carrying out the process, the mixture of carbon and inert substance is heated to 800-1000° C. by combustion of part of the carbon. Sulfur in the liquid or vapor state is added to the incandescent mixture. Carbon bisulfide produced is condensed outside the furnace, the furnace emptied, and the inert matter mixed with a further quantity of carbonaceous material before re-introduction. As carbonaceous material, crude lignite or briquettes produced by carbonizing a coke with a high superficial activity are suggested.

Magnesium Perchlorate—Explosive

Gerald Druce, author of the article "Magnesium Perchlorate As a Drying Agent," which appeared in British *Chemistry & Industry*, Jan. 18 issue, and was abstracted in CHEMICAL INDUSTRIES, February, p137, writes to the former.

". . . no mention was made of the fact that perchlorates are liable to cause explosions. When heated with organic matter rapid action occurs and in closed vessels an explosion would result."

Agricultural Chemicals

New Mechanical Methods of Potash Concentration

U. S. Bureau of Mines, Dept. of the Interior, announces that, for the first time, mechanical methods of concentration have been applied successfully to potash ores. Experimental work was carried out on material from Carlsbad, N. M., containing about 40% potassium chloride, the valuable mineral, and 60% sodium chloride. Over 96% of the potassium chloride in the original material was recovered in a concentrate containing 95% KC1 and only 5% extraneous matter.

Ores of this type are common in Europe and for years have served as the world's chief source of fertilizer potash. In the past, the valuable potassium chloride has been recovered by dissolving the ore in hot water, then cooling to precipitate the potash. This calls for the consumption of much heat. While efficient in the production of pure potassium chloride, it requires expensive equipment and is costly to operate.

The new development by the Bureau of Mines, part of which was conducted in cooperation with the Potash Co. of America, is a mechanical rather than a chemical process. High-grade concentrates were made with good recoveries by any one of three methods: tabling and flotation; tabling an agglomerated feed, supplemented by flotation; and all flotation.

Any system of gravity concentration, such as jigging or tabling, depends on the difference in the specific gravity, or unit weight, of the minerals involved. Thus galena with a specific gravity of 7.5 can be separated from quartz, specific gravity 2.65, with ease. However, the 2 minerals in the New Mexico potash ore offer quite a different problem; sylvite (KC1), specific gravity 1.99, must be separated from halite (NaC1), specific gravity 2.15. Closeness of these gravities (0.16) heretofore had defeated any attempts to apply mechanical methods to the separation.

To make gravity separation possible, the Bureau of Mines utilized the fact that there is more difference in the relative weights of these 2 minerals in a saturated brine than in pure water. Furthermore, both sylvite and halite are unaffected by brine, although dissolved by water. Hence all tabling was carried out in a circulating brine.

Best results were secured if the ore, prior to tabling, was treated with crude oil and an additional reagent. By such treatment the potassium chloride particles were coated with oil, while the sodium chloride was unaffected. The oiling accelerated the gravity separation, in fact, the capacity of the tables for an oiled feed was double that for untreated ore.

This discovery by the Bureau, that certain reagents would wet the particles of potassium chloride and stick them together, while leaving the other minerals unaffected was a logical development of previous Bureau research. In '31, the Bureau of Mines studied the application of agglomeration and tabling to certain non-metallic minerals. As a result, selective oiling and tabling are now being used for the commercial treatment of Florida phosphate rock for the recovery of fine material previously lost.

Excellent flotation results with low reagent costs were effected using sulfated alkyl alcohols, particularly the derivatives of alcohols with 8 to 12 carbon atoms. The reagents are expensive but only small quantities are necessary and the brine can be reused.

Details of this work are given in Report of Investigation 3271, "Concentration of the Potash Ores of Carlsbad, New Mexico, by Ore Dressing Methods" by Will H. Coghill, F. D. DeVaney, J. Bruce Clemmer and S. R. B. Cooke. Copies of this publication can be obtained by writing to the Bureau of Mines in Washington, D. C.

Status of American Potash Industry

Howard I. Smith, U. S. Geological Survey, tells members of the American Institute of Mining & Metallurgical Engineers:

"Paradoxically the U. S., which exports annually in its wheat and other crops more potash than is added as fertilizer to its soil, is allowing Germany, France, Poland, Russia and Spain to supply half its potash requirements at half the '32 price, although we have potash reserves of 100,000,000 tons in New Mexico and California and have now an annual producing capacity of a million tons of crude potash salts a year. In '32, this country was potentially free from further dependence on German potash resources. Now, however, the U. S. may be forced to drop from 3rd to 5th place as a potash producing nation by reason of its inability to duplicate the low labor costs in those countries, its own unrestricted admission of potash imports free of duty and its own exclusion from the principal foreign markets by the duties, quotas or embargoes involved. The widely heralded potash deposits of the Soviet Union (Russia) are declared to be the richest and most extensive in the world. The first mine to produce is at Solikomsk. Another mine is being put into operation at Berezniki."

Synthetic Nitrate Production

A process for the manufacture of synthetic sodium nitrate by carrying out the double decomposition reaction between calcium nitrate and sodium chloride in liquid ammonia was described by A. Guyer at the 14th Congress of Industrial Chemistry, held in Paris. In this process the calcium chloride produced precipitates out. It has more recently been found that economic yields are obtained when, instead of the solid compound, concentrated aqueous solutions of calcium nitrate are employed in the process.

Plant Operation

Is It Economical To Run Above Rated Capacity?

In his recent presidential address to the Coke Oven Managers' Association, G. J. Greenfield raised a point of interest to the whole chemical industry: to what extent should a plant be worked above rated capacity when to do so will result in shortening its useful life? A principle that was apparently introduced in America was to work every plant to its highest capacity and to scrap ruthlessly upon the smallest provocation, the idea being apparently a short life and a gay one. On the other hand it must be remembered that to-day most plants do not operate at such high pressures because the market for the product simply is not there. A plant is put down upon certain financial figures which take into account not infrequently quite a lengthy period of depreciation.

When the market improves, the tendency is to take advantage of the conditions to get the maximum output from the installation regardless of the probable effect upon the useful working life. The plant manager is not alone to blame because his sales manager and his superiors not infrequently applaud his efforts to increase the output. If that can be done by means which do not increase the wear and tear out of proportion to the output, there is no harm done. Not only may the plant be seriously affected detrimentally by pushing it too hard, however, but the actual result, whether in terms of ultimate products or of purity, may be different from what is expected. As Mr. Greenfield asked his own Association: "First, is it possible to overload the coke-ovens to the point of diminishing the yields of by-products per ton of coal or of reducing the quality of the coke? Second, is it not possible to reach a point where the more rapid usage of machinery results in wear and tear much greater than is proportional to the rate of usage?" These questions in an appropriate form may be asked of most branches of chemical industry. *Chemical Age*, British, Dec. 15, p. 530.

Mechanical vs. Labor In Roasting Operations

Progress in roasting operations has so far largely devolved upon the introduction of improved mechanical methods, so that large tonnages of material may be handled with a minimum of labor. A somewhat singular condition arises when it has to be admitted that mechanical methods in certain cases have failed and that a reversion to hand methods is advisable. Such conditions, however, exist in the roasting of certain chemical products, and so many disappointing results have accrued that hand-firing has been reverted to.

Although considerable tonnages of material could be roasted by mechanical method in a comparatively short space of time, it was soon realized that such roasting was far from perfect. Incidentally, breakdowns and temporary stoppages did much to militate against the advance of the mechanically operated hearth. The reasons for this are to be found in the general handling of all hot sticky masses, and at present mechanical ingenuity does not appear to be capable of surmounting these difficulties.

Manufacture of Bichromates

One of the cases where mechanical roasting furnaces have not always come up to expectations is in the manufacture of chromates and bichromates. At one works numerous designs of roasting furnaces supplied from different parts of the world were introduced, but without exception required to be dismantled. These included almost every conceivable type of roaster, such as shaft and arm-operated beds, travelling plough and chain-drawn cutters, and rotating hearths, etc.

A similar state of affairs exists in the roasting of mattes from smelting furnaces where a rich lead content is evident, but to a less extreme extent. With the latter, mechanically operated hearths are persevered with, but it is recognized that they are usually far from perfect. What happens in the roasting of all sticky masses is that the rakes become clogged, the mass is not thoroughly mixed up, and hence imperfectly roasted; while the arms which hold the rakes lack the necessary power to continue their motion, whereby the whole furnace has to be shut down to rake out the bed.

Today several firms have introduced hand-operated furnaces, but which are constructed on the latest lines as regards simple handling of the sticky masses and fuel economy. The best possible mechanical systems are employed for conveying the mass for roasting to the hearth, and the resulting product to the lixiviation tanks.

In the case of chromate and bichromate manufacture, a considerable number of these hand-operated furnaces are used, and the chrome ore and fluxes are mixed throughout by hand.* As the best conditions of supplying air and heat are employed, the time involved in roasting or calcining is reduced to a minimum, and the hot mass is almost instantaneously handled mechanically from this point. The furnace doors are small, and the sides are well insulated, so that the furnacemen are not exposed to any excessive temperatures while rabbling the semi-fused mass. As the chromate and bichromate liquors are pumped, evaporated, and the crystals handled with the latest makes of chemical engineering plant, it will be appreciated that the reversion to hand-operated roasting furnaces has only been the result of extensive practical experience.—British *Chemical Trade Journal*, Jan. 11, p4.

Raw Materials

A Really Scientific Basis of Coal Purchasing

The buyer and seller of coal are about to get together on a common scientific basis with fair prospect of seeing eye to eye on the much discussed question of specification which in the past has led to mutual distrust and misunderstanding. Coal consumers are to have factual engineering data to govern their purchases for any given set of conditions and coal producers are to have similar data to govern the preparation of fuel suited to a wide variety of consumer needs. A constructive study in this direction is now in the hands of a Joint Committee on Fuel Values, sponsored by the American Institute of Mining and Metallurgical Engineers, and the American Society of Mechanical Engineers, according to A. B. Parsons, secretary of the former society. Results will be made available to the public. In a preliminary report, which has been officially approved by the 2 engineering societies, the committee states:

"While no definite values can be assigned to individual coal qualities for steam-generating purposes, Committee is of the opinion that there is an opportunity for much constructive work in the collection, organization and interpretation of experience data, which will assist the individual consumer to establish his own scale of values to suit his particular circumstances, and be helpful to the coal industry in the preparation of coal to meet a wide variety of consumer requirements.

"The Committee will study, on the basis of practical operating experience, the relation of individual coal qualities to the plant conditions which they affect in order to establish, where possible, the limits within which, under certain conditions, specific coal qualities may affect efficiency, operating costs, and capacity; and to suggest methods by which the individual consumer can arrive at his own scale of values."

The problem confronting the Joint Committee is a complex one. For, as stated in the report in question, coal has 15 different physical and chemical properties, coal consuming plants may vary from one another in 18 different respects and the

* In the U. S. the tendency of bichromate producers in the last 5 years has been to the mechanically operated furnace.

quality of coal burned may affect plant efficiency in 4 different ways, operating cost in 3 different ways and capacity in 6 different ways. Data from practical experience having a bearing on these and many other points will be collected, organized and interpreted for the benefit of technician and layman alike.

Coal-Tar Chemicals

Type of Coal For Coal Carbonization

An interesting lecture on coal carbonization was given at King's College, London, by Dr. Sinnatt, M. I. Chem. E., F. I. C., Director of Fuel Research, Dept. of Scientific and Industrial Research. Dr. Sinnatt gave an outline of the application of science to the distinction of kinds of coal for the determination of the commercial value of a seam. The characteristic properties most used were those of volatility and the "swelling power," together with the associated spores which were identified under a microscope. The method adopted to determine "swelling power" was to compare the volume of a given sample of finely powdered coal before and after heating for a certain period and temperature in a closed tube. The particles of coal when heated were found to become transparent when they were examined under the microscope. The structure of the particles was identical with the bubbles of the froth of paraffin wax.

Undoubtedly the most important method of identification, said Dr. Sinnatt, was by means of the spores found with the coal. This method was one which was being improved at the moment. X-rays were also used, and were found of great assistance, especially in the identification of inorganic matter and the smallness of the coal resulting from breaking up a particular sample. This latter, an important commercial aspect, was seen by transparent lines indicating a weakness in the structure and therefore a likely point for fracturing to occur. Spectroscopic analysis, as suggested by Goldsmidt, was also used to determine the elements present—a very valuable piece of information for coal which was to be used for the preparation of petroleum, since coal containing tin or germanium was easier to hydrogenate as these elements catalyzed the process. Another method of coal identification was by the "float and sink" method by which the hydrogen content (also a very important piece of information for petroleum preparation) could be determined.

Dr. Sinnatt then discussed the structure of the coal molecule, which seemed to be benzenoid. This theory was supported by Professor Bone (who had prepared benzoic acid from coal by oxidation) and by Dr. Sinnatt's work in the production of aromatic compounds by the hydrogenation of coal. The hydrogenation of coal was achieved by the careful regulation of the temperature and of the pressure of hydrogen. About 0.07% of stannous hydrate was used as a catalyst in the process by which 70% of the weight of coal used appeared as a colorless liquid which contained, however, a large proportion of highly unsaturated compounds. Dr. Sinnatt finished by saying that this field of knowledge required early development and, while a plant was being erected in England for the preparation of 30,000,000 gals. of petrol per year and in Germany a train was in the near future to be run on pulverized coal, these developments were due to the unaided efforts of the industry itself, for it received little support from the academical side of chemistry. Summary appearing in the British *Chemical Age*, Dec. 1.

Safety

Practical Rules For Tank Cleaning

N. H. Marlette, safety engineer at Tennessee Copper's Copperhill, Tenn., plant, lists simple rules for cleaning tanks of 1,200 to 5,000 tons capacity in the latest issue of *Chemical Safety*, issued by the Chemical section of the National Safety Council.

(1) The inlet valve is closed and a blank inserted between flanges that are between valve and tank so that the leaking of the valve or the accidental opening of the valve will not allow acid to enter the tank.

(2) Remove upper and lower man-hole covers to ventilate tank.

(3) With a long handle hook, tip the boot around outlet and drain off liquid acid. (After one or two days, gas and acid will be out.)

(4) Disconnect outlet line from main header and connect lead line to outlet for draining, removing the service valve and using in its place another valve for this purpose, as the regular service valve is rendered unfit for use.

(5) With a long handled steel hoe, operated from outside of lower man-hole, rake sediment to the outlet until enough working room has been cleaned inside to allow man to stand safely.

(6) When entering the tank through the man-hole, the tank cleaner is equipped with good rubber boots, goggles and rubber gloves. The boots are made skid-proof by wrapping six or eight turns of heavy copper wire around boots at the instep with several times back around the ankle to keep wire in place.

This is very important.

(7) Adequate light is provided by an extension cord lamp hung through the upper-man-hole.

(8) Sediment is then removed by raking with a steel hoe toward the outlet.

(9) If nitre gas is encountered (it is quite often trapped in the sediment), the tank cleaner wears a gas-mask equipped with a No. 1 canister.

(10) Do not rush the work, but do it thoroughly. Doing it in haste is a sure way of making it harder to remove and it is unsafe.

(11) Use no water in the tank. If the sediment is too thick to run through the drain line, couple the water hose to the tee, provided for that purpose, in the drain line on outside of the tank.

(12) When the tank is cleaned, put it back in service and immediately run in enough acid to cover the bottom to a depth of at least six inches to prevent weak acid from attacking the calking of the seams.

If the tank is to be left out of service, after cleaning, neutralize the remaining skim of acid mud on the bottom by the application of slaked lime and then wash the bottom thoroughly with a hose operated from the outside of man-hole. Sweep the bottom as dry as possible and leave it disconnected with the bottom man-hole cover off.

Approved Dust Respirators

In view of the increasing importance of the problem of dust control in mining, chemical, chemical process and other industries, and in line with its policy of testing respiratory protective equipment for permissibility for use in mines and in the mineral industry, the Bureau of Mines has formulated a series of tests for determining the efficacy of filter-type respirators designed for use against mechanically generated dusts, fumes of various metals, and mists. These tests are described in Schedule 21, "Procedure for Testing Filter-Type Dust, Fume, and Mist Respirators for Permissibility."

Schedule 21 supplies a long recognized need; a federal testing code to which respirator manufacturers could turn for certification of their product. Purchasers of respirators approved by the Bureau can be assured that the devices will pass the minimum requirements given in schedule 21, namely, that the respirator must provide adequate protection with reasonable comfort to the wearer. Requirements of schedule 21 cover the packaging, marking, materials, design, construction, resistance to air flow, and filtering efficiency of the respirator.

Up to Feb. 15, '35, 4 respirators have been approved by the Bureau for permissibility against Type A (dusts) suspensions of atmospheric particulate matter. These respirators are:*

1. M. S. A. Comfo Respirator made by Mine Safety Appliances Co., Pittsburgh, Pa. Approval number BM-2101.
2. Willson Bag Respirator No. 300 made by Willson Products, Inc., Reading, Pa. Approval number BM-2102.
3. Willson Bag Respirator No. 400 made by Willson Products, Inc., Reading, Pa. Approval number BM-2103.
4. Pulmosan M-15 Respirator made by Pulmosan Safety Equipment Corp., Brooklyn, N. Y. Approval number BM-2104.

Plant Equipment

Glass Silk As An Insulating Medium

The notable advances which have been made during the last 2 or 3 decades in the methods of heat conservation have been of as much importance to the chemical engineer as to the

* Others have been submitted and are being tested.

workers in other industries. The chemical engineer, in fact, has had his own special problems to surmount, and it may be said that of the insulating materials recently developed glass silk possesses such advantages as to make the solution of these problems considerably easier. The efficiency of glass silk from the point of view of thermal conductivity has been demonstrated in tests at the National Physical Laboratory and in the laboratories of the manufacturers. On these tests glass silk will bear comparison with any other heat insulator. Moreover it can be used at temperatures up to 900° F., at which other materials fail.

Practicability Yet To Be Demonstrated

It remains therefore to demonstrate the characteristics which make for economy and stability in use. Glass silk is made by a process in which the original good quality glass is "spun" to fine strands, possessed of high tensile strength, and therefore capable of being folded and crushed without ill-effect. It is supplied to the engineer in the form of "strips," "sheets," or "mattresses," of the strands intimately meshed, or in partially teased-out "ravelled" form, according to the nature of the surface to be insulated. In such forms the insulation can be applied quickly, and if repairs or alterations of plant are desirable it can be removed as readily. In addition, it can be used again in the same position. Pre-mixing, or other preparation of the material is not necessary, and it can be applied while the plant is in use, and perhaps hot. The economies of time, labor, and material, with such an insulator, are obvious. It is also obvious that as there is nothing but glass in its composition, it is unaffected by chemical fumes. Since glass is non-hygroscopic, glass silk prevents, rather than assists, corrosion of insulated surface, as do some insulating materials. It is also insect-proof, fungus-proof, rodent-proof, and wholly unaffected by vibration of plant. All these factors contribute to an exceptional degree of permanence, and therefore of economy. *Chemistry and Industry*, British, Dec. 7.

Testing of Stills

The Association of British Chemical Manufacturers has just issued a revised set of instructions on the subject of testing of stills employed for the distillation of inflammable liquids. The recommendations have been approved by the Works Technical Committee of the Association and certain parts, at least, should be of interest to plant managers in this country.

Rule 1.—Every still used for distilling inflammable liquid, that is to say, any liquid flashing in the Abel apparatus below 80° F., shall be carefully examined and tested at least once a year by a competent person by a method or methods appropriate to the particular type of still.

Rule 2.—Suitable precautions shall be taken to prevent the escape of inflammable liquid from any still through the fracture of any gauge-glasses.

Rule 3.—In those buildings or parts of factories where inflammable atmospheres are likely to be produced, all electrical fittings shall be of the flame-proof type and made to British Standard Specification.

Rule 4.—In factories where inflammable liquids are handled, valves or switches designed to cut off the supplies of steam, gas, and electricity for the plant in which such liquids are used, shall be provided at an adequate distance from such plant. These shall be additional to those required at the plant for the actual control of the operations.

The following explanatory notes are appended to the above rules:—

Rule 1.—Among the methods that may be used for testing are a hydraulic test with water or oil, an air test, a hammer test, and drilling for thickness. In some cases a steam test has been found useful for detecting defects, but great care must be exercised in applying such a test so as not to set up dangerous strains in the material of the still.

Rule 2.—Gauge glasses fitted to stills used for inflammable liquids to indicate the level are liable to be fractured, and are then a source of danger. Fracture may occur either through a blow on the glass or through a sudden change of temperature. The first risk can be minimized by enclosing the gauge glass in a suitable guard, and the second by using a gauge of a specially resistant glass. The danger due to escape of liquid from the still arising from breakage of the gauge glass may be met in most cases by arranging for bottom stopcocks to be kept closed by weighted levers, spring-controlled valves, or some other means, except when it is necessary to take a reading. It has been suggested that there may be risk of breakage of the glass when the hot liquid of the still is put into communication with the relatively colder liquid in the gauge, but this risk will be very small in the case of gauges made of a suitable glass. Even where there is a liability of the plug of a gauge cock sticking or gumming, the result of this will be less serious in the event of a glass breaking if the plug is in the closed position than if it were stuck in the open position.

Rule 3.—The ordinary types of switches, fuses, motors, and other electrical apparatus can often be installed outside such buildings in positions where there is no risk of an inflammable atmosphere.

Preventing Flow of Liquids

Another precaution that may often be usefully adopted is the provision of some means to prevent the spread of liquid, should a leak occur, such as the construction of ramps or low walls either round the plant or at doorways. Care should also be taken, when necessary, to isolate the plant from boiler fires or similar sources of ignition, by means of suitable partitions.

The Laboratory

Why Is the Plant Laboratory Slow?

It is not infrequently that the works laboratory is blamed for holding up an urgent analysis, but it is frequently true that the blame has been wrongly placed. It is the plant executives who are at fault for their lack of attention to modern needs, in not providing the laboratory with equipment which allows the analyst to speed up his work by recognized and legitimate methods. In many directions the use of optical instruments will effect a notable saving in time, in comparison with wet methods of analysis—where it may be necessary to "boil slowly for 15 minutes," "allow to stand undisturbed for 10 minutes," "filter, ignite and cool in a desiccator." Even official methods of analysis with their outstanding conservatism, are now adopting the use of optical instruments to a notable extent—spectrograph, comparator, refractometer and colorimeter. The quartz spectrograph records all wave-lengths which are useful for chemical analysis, and the observations are made by photography so that they become permanent records which are capable of showing a complete qualitative analysis; in some cases a surprisingly accurate quantitative analysis is also possible. Optical instruments are not unduly expensive when it is taken into consideration that they will last 10 or 20 years, and that during the whole of this period they are effecting a notable saving in time combined with a great and constant accuracy in analytical results. *Chemical Age*, British, Dec. 15, p. 530.

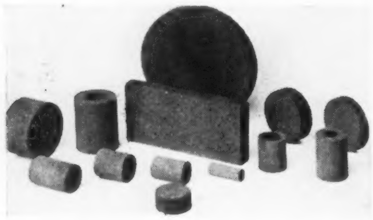
Cleaning Glassware

An efficient method of cleaning volumetric glassware is to rinse the apparatus with benzene (which need not be of the highest purity), then with concentrated sulfuric and finally with water until all traces of the acid are gone. It is claimed that even the dirtiest burette can be cleaned in 5 minutes by this method.—*Chemical Engineering & Mining Review*, Australia.

New Equipment

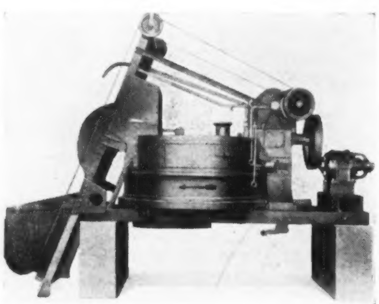
A New, Corrosion Resistant, Filter Material

A new filter material, "Fabricated Filter Carbon" has just been announced. It is available in a variety of forms, plates, pipe and blind end tubes, and can be produced in special shapes for specific filter design. It is said to be an ideal filtration medium for oils, gases, chemical solutions, bleaching solutions, corrosive liquids and gases. Salient characteristic claimed for this new filtering medium is its resistance to corrosion. It is said to be unaffected by all acids, alkalies, and corrosive materials except hot concentrated solutions of a highly oxidizing character. On this account it is especially recommended for the filtration of liquids and gases which might be contaminated by corrosion of other filtering materials. Fabricated Filter Carbon is said to be light in weight, mechanically strong, highly resistant to thermal shock, readily machined and easily cleaned. It is produced in several grades, each possessing a different degree of porosity. **Q C 221**



A New Mixer With Several Innovations

A unique feature of the design of a new mixer is the revolving pan that carries the ingredients to the mixing area where one or more assemblies of plows or plows and mullers, whirling in counter direction produces a thorough and homogenous mix. From the mixing area, the materials are passed outward; they are then turned with side plows and scrapers and carried back into the mixing area by the revolving pan in a continuous cycle. "Dead Spots" are eliminated. Every portion of the batch is subjected to the action of the mixing units with every revolution of the pan. Practice of overloading the formula with certain ingredients (usually the more costly ones) to insure adequate dispersement to all parts of the batch is no longer necessary. "Thinner" formulas, reflecting substantial savings in material costs, can be used with entire satisfaction.



Mixing time is said to be greatly reduced. It is claimed that identical batches that require 5, 10 or even 20 minutes of continual mixing in contemporary equipment, can be loaded, mixed and discharged from the new mixer in from 3 to 5 minutes without impairing the quality or the character of the finished mix. **Q C 222**

Cabinet Meter Panels

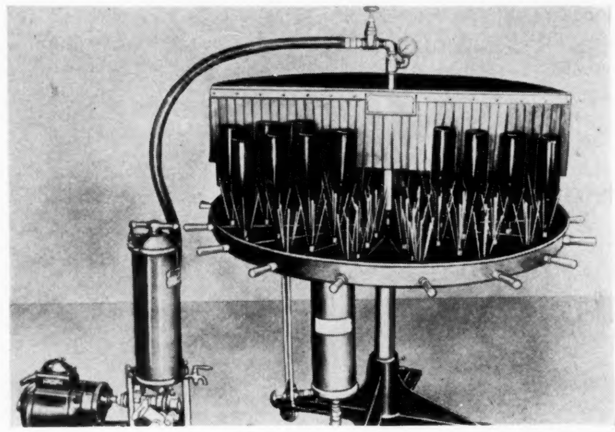
A cabinet type steel meter panel equipped with doors to protect and conceal meter and control connections is now being offered. **Q C 223**

New Laboratory Mixer

A new laboratory size intensive mixer is now available, equipped with vacuum for de-airing and heating elements for temperature control during the mixing operation. **Q C 224**

A Revolutionary Bottle Rinser

A bottle rinser entirely new in principle and operation provides for the thorough cleaning of bottles of all sizes and shapes with the same liquid with which the bottles are later to be filled. Four to 5 gals. of the liquid itself is used to wash thousands of bottles absolutely clean and without fear of spoilage or contamination. An internal pressure filter that comes with the rinser removes all dirt and sediment after each set of bottles has been washed. The cleaned liquid is then pumped into the rinsing unit again and thoroughly washes the next set of bottles under pressure. This operation is continuous. The same liquid is constantly being pumped through the filter into the bottles and then back again through the filter.



This new principle eliminates all plumbing, piping and draining installations as well as costly water bills. At the end of the day when the washing operation is finished the 4 or 5 gals. of liquid that have been used for washing the bottles is perfectly pure and clear. It is not wasted. **Q C 225**

Aids to Plant Maintenance

A new liquid belt dressing for rubber belts, produced by one of the large rubber companies, is said to have a number of superior qualities over existing products. It will, it is claimed, increase pulley grip without any deleterious effect on the belt. **Q C 226**

Plant managers are puzzled over corrosion of steam jets where they are used to inject steam into corrosive products, such as nitric, muriatic, hydrofluoric and pickling acids. New jet made of carbon product is said to be the answer. **Q C 227**

A new product is about to be placed on the market which is used on galvanized iron to insure paint adhesion. **Q C 228**

Recently patented and of interest to many lines of manufacture, engineering, maintenance and construction, is a new acid proof cement which will harden by setting within 36 hours without the old method of delayed drying. This cement is mixed with water to a creamy consistency. It hardens into a porcelain like structure and will increase the use of acid proof brick, because heretofore the construction was only as strong as the cement. This cement will also resist water, fumes and many solvents, also fire. **Q C 229**

Do you have trouble making up tight joints between pieces of chemical stoneware? A new patented rubber joint is said to make a perfect and economical solution to the disagreeable problem. **Q C 230**

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

Q C 221	Q C 226
" 222	" 227
" 223	" 228
" 224	" 229
" 225	" 230

Name ....

Title ....

Address ....

Packaging, Handling and Shipping

¶*Simplified Practices In Steel Drums Renewed—Investigating the Rosin Barrel Problem—Cooperage Convention—I. C. C. Notes and Rulings—With the Container Companies*

Division of Simplified Practice of the National Bureau of Standards announces that Simplified Practice Recommendation R20-28, Steel Barrels and Drums, has been reaffirmed again by the Standing Committee of the industry.

This simplification program, which was proposed and developed by the industry, establishes a recommended schedule of stock types and capacities. The original recommendation became effective Jan. 1, '25. It was revised Jan. 1, '28 and reaffirmed in 1929, 1931 and again this year. Copies of the recommendation may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5c each.

Naval Stores Station Studies Rosin Containers

Experiments at the Naval Stores Station at Olustee, Fla., indicate that the alternate exposure of the tight heads of rosin barrels to rain and sunshine, to swelling and shrinking undoubtedly causes the warping and pulling out of these heads, and where the rosin is stored out of doors, as is the general practice, consideration must be given to the prevention of warping of the heads if they are to remain tight and solid for 6 months or more.

The indications are that to prevent this warping and pulling out, the croze must be at least three-eights of an inch deep, the top heads should be thoroughly seasoned or dried before the barrel is made up, the cross pieces on the top head should be at least 5 inches wide, carefully fitted and securely nailed in place across the grain of the head, and should completely cover the opening through which the barrel is filled. Obviously, while the croze should be deep enough to hold the head it must not be so deep that the chime will break when the barrel is picked up with hooks in loading for shipment.

In these experiments it was found that the creosoted bottom heads of all barrels which are raised about 4 inches above the ground on poles are in good condition after 2½ years' storage. The top heads (which were not protected by a cross piece) warped badly after 6 months' storage, the majority of them have pulled out of the croze, and all barrels would have to be recoopered and the hoops redriven before they could be shipped.

Experiments to determine definitely just how tight head barrels should be made have already been started at the Naval Stores Station in co-operation with the Forest Service. Producers are invited to inspect the tight head rosin barrels now on storage at the station.

Wooden Cooperage Notes

Those responsible for packaging of chemicals in bulk will find it worth while to visit the 20th annual convention of the Associated Cooperage Industries of America at the Hotel Jefferson in St. Louis, May 14-16.

A comprehensive list of all cooperage companies, stock producers and members of allied industries, such as cooperage supply houses, has been compiled by the office of the Associated Cooperage Industries of America and is available upon request. This makes the first time that an attempt has been made to list all firms, irrespective of membership. The booklet will make a valuable reference.

There is a short article on the experiences of Church & Dwight in packaging bicarbonate of soda in wooden barrels in the current issue of *The Wooden Barrel*, official organ of the Associated Cooperage Industries of America.

I. C. C. Rulings Last Month

Holding that operation of Seatrain Lines, Inc., in transporting loaded freight cars between N. Y., New Orleans and Havana was in the "public interest" and "of advantage to the convenience and commerce of the people," the I. C. C. ruled (Feb. 12) that railroads should interchange cars with the water carrier. It ordered the roads to post rates with the commission by April 5.

Opposition of Eastern railroads to the Seatrain carrier, which was said in testimony to give the 2 Western railroads a "through route to New York," was ignored in the decision although Commissioners Mahaffie and McManamy dissented from the opinion on the ground that the water carrier was not a railroad in the true sense of law.

"By using Seatrain service shippers obtain what is practically equivalent to all rail service," the commission said, adding that direct improvements saved packing and handling expenses.

Lime Hearing, March 14

Hearing on Docket 4065, which involves freight rates on lime from, to, and between Eastern trunk line points, originally scheduled for Feb. 10, is advanced to Mar. 14, according to a recent I. C. C. order.

N. Y. Public Service Commission Rate Changes

Several rate revisions were announced in the past month by the N. Y. Public Service Commission.

Of the D. L. & W., on paradichlorobenzene, in bulk, carload, minimum weight 36,000 pounds, from Solvay and Syracuse to Niagara Falls and Suspension Bridge, on the Erie and Lehigh Valley, and from Solvay to Niagara Falls and Suspension Bridge on the N. Y. C. and West Shore, 23c per hundredweight. Reduction from class rates. Effective Mar. 1.

Of the N. Y. C. (East), on paradichlorobenzene, in bulk, carload, minimum weight 36,000 pounds, from Solvay and Syracuse to Niagara Falls and Suspension Bridge, 23c per hundredweight. Reduction from class rates. Effective Mar. 1.

Brown with Wilson & Bennett

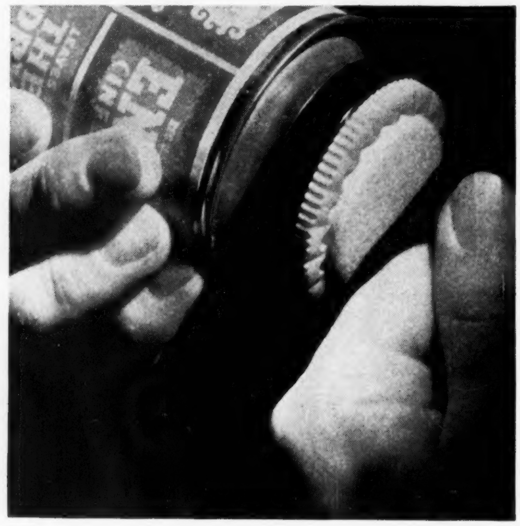
Wilson & Bennett Mfg. Co. appoints James H. Brown, 1039 Woodruff st., Toledo, as sales representative in Toledo. Mr. Brown is thoroughly familiar with the steel container business and the requirements of shippers in practically all industries, and is in a position to extend unusually practical cooperation and service to users and prospective users of steel pails, barrels, and drums. He was formerly with Detroit Steel Barrel and American Steel Package.

Gair Adds to Canadian Interests

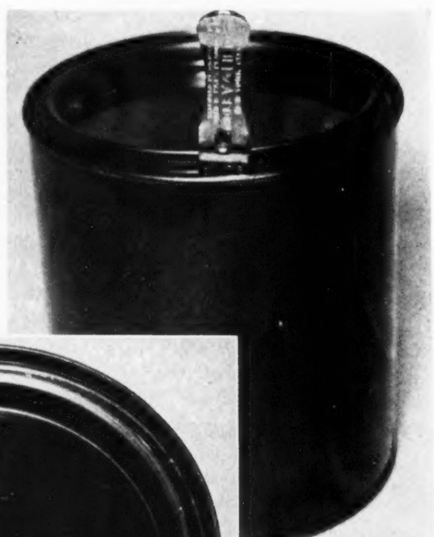
Robert Gair Co. is adding to its Canadian interests The Corrugated & Container Co., Ltd., Hamilton, and Concord Shipping Containers, Ltd., Toronto. Both companies have been active in the shipping containers field in Canada and have a combined capacity of about 7,500 tons a year. Business of both will be carried on with no change in management or representation.

An outstanding prize winner in the recent All-America Package Competition conducted by "Modern Packaging". The du Pont family of chemical specialties was awarded first prize in the Family Group Section.

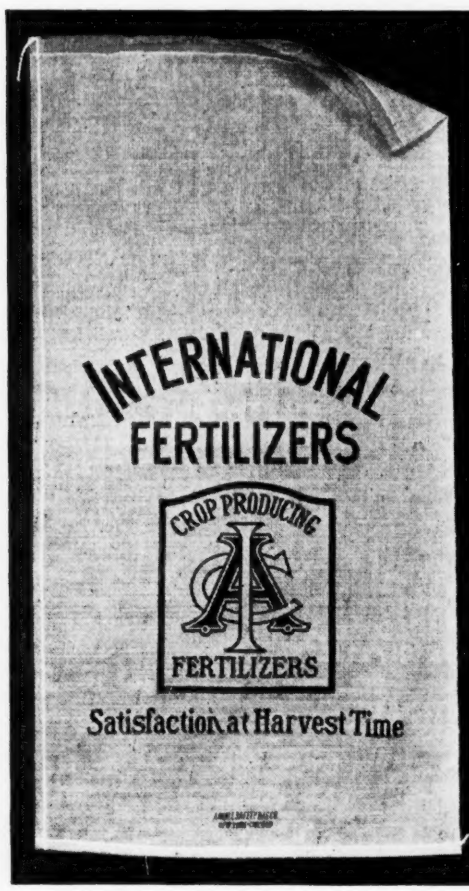
A lot of people will appreciate the manufacturer thoughtful enough to use this unique dispensing top for a spotting fluid. A quarter-turn opens the device, permitting the liquid to seep into the cleaning pad. The double moulded cap is made of Durez and was designed and executed by Plastic Engineering Co.



Another suggested solution to that ever-present question of a cover for your product that does not "try the soul" of your customer attempting to get at your product. The patented Lev-A-Lift Co. lever removes the plug of friction plug cans with ease and without distortion; is permanently attached to the plug, does not interfere in tightly closing the lid, or in stacking one can on top of the other.

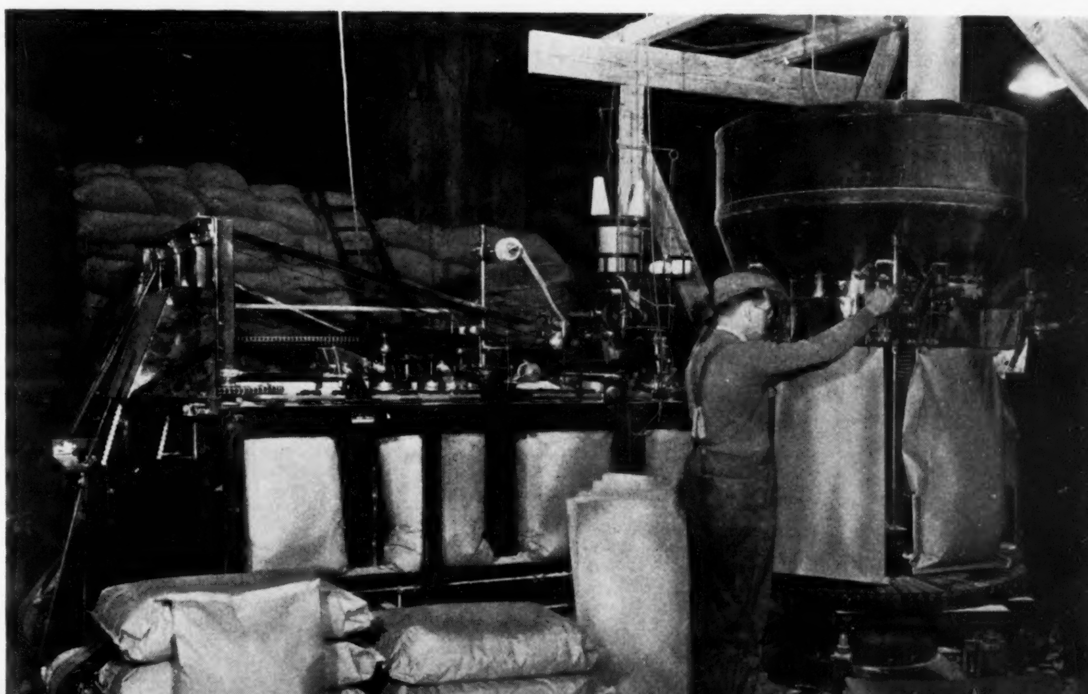


A new revolutionary idea in bags by Arkel Safety Bag that is bound to build up goodwill and sales for fertilizer and industrial chemical companies. A paper lining is inserted within the burlap bag and firmly attached to the latter for a depth of 6 inches from the top. After the original user has emptied the bag, he pulls out the paper lining and has, as his bonus, a brand new, clean, uncontaminated bag for re-use.



And now in the bottle group: Left, Visco Chemical Products of Cleveland, Ohio, after improving its product decided that a newer, up-to-date container was a necessity. The result, everyone will agree, is one that is simple but attractive, a container that has "sales appeal." Right, the manufacturers of "Wipe-On," a new synthetic resin varnish finish that can be applied with a cloth and is especially recommended for home refinishing, adopt the bottle and a plastic cap for a merchandising drive in the chain stores. Bottle retails for 20 cents in most cases. The bottle for the Visco polish is by Fairmount Glass Works, Indianapolis, label by Stecher-Traung Litho. Corp., Rochester, and the cap is by Anchor Cap & Closure Corp., Long Island City. Lawrence Wilson was the designer.

A double winner. The new heavy-duty multiwall paper bag adopted by American Cyanamid for packaging its Granular "Aero" Cyanamid in recent packaging competitions has won the following awards: 1. Award for "most meritorious shipping container placed on the market in 1934."—American Management Association technical container competition. 2. Second place in the shipping container classification of "Modern Packaging's" competition. 3. Honorable mention, American Management Association's shipping container classification, design competition. Contributors in the design, Huckins-Smith, Inc.; The Mitchell Fenberg Studios; R. W. Lahey and George B. Winner of the Cyanamid Company. Bag is by Bagpak, Inc., and to the right is a typical Bagpak installation. Note the economy of space. Photograph illustrates the automatic model and shows the Bagpak Methcd of packaging in open mouth, cushion stitch, multiwall paper bags with patented sift-proof closure effected by means of reinforced cushion stitch and creped paper. Sealing tape assures complete sift-proofness, cleanliness, sanitation, moisture-resistance and overall packaging economies. Adaptable to free-flowing materials such as heavy chemicals, fertilizer, salt, and other commodities, in 100-lb. units.



U. S. Chemical Patents

A Complete Check-List of Products, Apparatus, Equipment, Processes

Patents—Industrial Chemicals, Apparatus, etc.

Process forming 1, 3-diamino-2-propanol; effecting reaction of 1, 3 dichlor-2-propanol with ammonia in presence of a fixed alkali and water. No. 1,985,885. Robert Roger Bottoms, Louisville, Ky., to Girdler Corp., Louisville, Ky.

Process making acetyl benzoyl peroxide; reacting upon benzaldehyde and acetic anhydride with an oxygen-containing gas in presence of dibenzoyl peroxide. No. 1,985,886. Thos. F. Carruthers, So. Charleston, W. Va., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Preparation product of methylolurea; using a polyhydric alcohol and a methylol urea. No. 1,985,937. Martin Luther, Mannheim, Germany, to I. G., Frankfort-am-Main, Germany.

Production condensation products; by causing ethylene glycol to act upon thiourea, next causing formaldehyde to act upon the condensation product so produced. No. 1,986,067. Max Paquin, Konigstein-on-the-Taunus, Germany, to I. G., Frankfort-am-Main, Germany.

Production ethylene oxide from chlorhydrin by treatment with alkali. No. 1,986,082. Ferdinand Bernard Thole, Stanley Francis Birch, and Wm. Dallas Scott, Sunbury-on-Thames, England, to Anglo-Persian Oil Co. Ltd., London, England.

Production basic aluminum sulfate, commercially free from iron, from an acidic iron-containing solution of an aluminum compound. No. 1,986,091. Robert Odiorne Wood, Hamburg, N. Y., to National Aniline & Chemical Co., New York, N. Y.

Production carbon black from hydrocarbon oil. No. 1,986,198. Jacob Benjamin Heid, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Catalytic production of vinyl-aryl compounds. No. 1,986,241. Carl Wulff and Ernst Roell, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Acetylene gas generator. No. 1,986,254. Ernest Dautel, Hartford, Conn., one-third to Stewart Blackman, Washington, D. C.

Hydraulic pressure transmitting fluid; consisting of monoethyl ether of diethylene glycol in solution with a triethanolamine salt of an organic acid. No. 1,986,260. Robert E. Fulton, Pittsburgh, Pa., to Puritan Soap Co., Rochester, N. Y.

Dye producing composition; mixture of combinable quantities of a coupling component and a diazoimino compound. No. 1,986,276. Eugene A. Markush, Jersey City, N. J., to Pharma Chemical Corp., New York, N. Y.

Preparation acetaldehyde and acetic anhydride by splitting ethylidene diacetate in presence of a halogen compound. No. 1,986,322. Louis Victor Clouzeau, Meudon-val-Fleury, France, to E. I. du Pont de Nemours & Co., Wilmington, Del.

Apparatus for manufacture salt. No. 1,986,334. Milton J. Gearing and Wm. F. Downing, Jr., St. Clair, Mich., to General Foods Corp., New York, N. Y.

Apparatus for effecting gas reactions. No. 1,986,348. Burritt Samuel Lacy, Red Bank, and Harlan A. Bond, Metuchen, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process oxidizing ammonia to oxides of nitrogen. No. 1,986,396. Stanley L. Handforth and Wm. E. Kirst, Woodbury, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method testing chlorine solutions of different strengths; using a diluent and ortho-tolidine. No. 1,986,403. Henry W. Lemkuhl, Rochester, N. Y.

Preparation a crystalline manganese nitrate hydrate-urea compound having melting point not below 40°C. No. 1,986,495. Ernest R. Boller, Cleveland Heights, Ohio, to Grasselli Chemical Co., Cleveland, O.

Preparation magnesium hydroxide. No. 1,986,509. Walter Hoge MacIntire, Knoxville, Tenn., to American Zinc, Lead & Smelting Co., St. Louis, Mo.

Apparatus for chemically cleaning fabrics, textiles, etc. No. 1,986,548. Georg Wolff, Munich, Germany, to Alex. Wacker Gesellschaft fur Elektrochemische Industrie, G. m.b.H., Munich, Germany.

Process impregnating catalyst carriers with metallic catalytic agents. No. 1,986,557. Gerald C. Connolly and Jeremiah A. Pierce, Balto., Md., to Chester F. Hockley, receiver for Silica Gel Corp., Balto., Md.

Process recovering beryllium oxide from siliceous ores containing beryllium and aluminum together with a heavy metal. No. 1,986,567. Karl A. Ferkel and Abram I. Ellis, Los Angeles, Cal., to Beryllium Corp., New York, N. Y.

Manufacture bleaching powder; using hydrogen peroxide, sodium bicarbonate, and anhydrous sodium carbonate. No. 1,986,672. George Harry Bergman, Chicago, Ill.

Production fireproof material; adding a weak aromatic acid to an aqueous solution of magnesium chloride containing calcined magnesite. No. 1,986,692. Bruno Ullrich, Hamburg, Germany, to Heinrich August Steines, Gross-Flottbek, near Hamburg, Germany.

Process sulfonating an acetylated hydroxy fatty acid substance with sulfur trioxide in liquid sulfur dioxide. No. 1,986,808. Richard Greenhalgh, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd., London, England.

Air dehydrating apparatus. No. 1,986,814. Harry Buxton Hartman, Buffalo, N. Y.

Preparation refined, non-distilled, liquid talloel substantially devoid of solid constituents and ligneous matters of sulfate black liquor, and containing amounts of resin acid. No. 1,986,815. Torsten Hasselstrom, New York, N. Y.

Production a hydrocarbon of the acetylene series; heating an olefine dichloride to at least 800°C. No. 1,986,876. John P. Baxter, Wm. A. M. Edwards, and Ramsay Middleton Winter, Norton-on-Tees, England, to Imperial Chemical Industries, Ltd., London, England.

Manufacture aliphatic alcohols by hydration of the corresponding olefines in presence of a strongly basic inorganic substance. No. 1,986,882. Henry Dreyfus, London, England.

Method preparing a molding powder, comprising disintegrating spent filtering material which has been used for filtering organic derivatives of cellulose. No. 1,986,879. Camille Dreyfus, New York, N. Y., and Wm. Whitehead, Cumberland, Md., to Celanese Corp. of America, Delaware.

Manufacture ammonium salts; first step, contacting a solution of an iron salt with ammonia vapor free of acidic constituents. No. 1,986,900. Fred. W. Sperr, Jr., Phoenix, Ariz., to Koppers Co. of Delaware, Pittsburgh, Pa.

Manufacture laminated sheet material that is water- moisture- and grease-proof and free from objectionable odors. No. 1,986,954. Allen Abrams, Wausau, Paul L. Anthony, Neenah, Geo. J. Brabender, Wausau, and Winfred H. Graebner, Neenah, Wis., to Marathon Paper Mills Co., Rothschild, Wis.

Refrigerant composition; using methylene chloride and ethyl chloride. No. 1,986,959. Ransom W. Davenport, Detroit, Mich., to Chicago Pneumatic Tool Co., New York, N. Y.

Treatment an acidic nickel-copper solution containing an objectionable amount of iron in solution. No. 1,986,967. Anton Martin Gronningsaeter, Minneapolis, Minn., to Falconbridge Nickel Mines Ltd., Toronto, Ont., Canada.

Prevention corrosion in urea synthesis; involving heating of ammonia and carbon dioxide in a metallic vessel. No. 1,986,973. Harry C. Hetherington and Harold W. de Ropp, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Device for spraying freshly printed sheets with a solidifying liquid. No. 1,987,046. Kurt Bergner, Taucha, near Leipzig, Germany, to "Rodas" Maschinen-Fabrik Roderick W. Horne, Taucha, near Leipzig, Germany.

Improved dry stabilized bleaching composition for use with addition of water; using sodium peroxide and a soluble fluosilicate. No. 1,987,059. Gustav W. Goerner, Bourne, Mass.

Packing composition for different industrial uses, including lubricating purposes, containing powdered unalloyed metallic antimony as the metallic ingredient. No. 1,987,109. Geo. B. Jack, Jr., So. Salem, N. Y., to The Dorin Corp., Union City, N. J.

Preparation an alkoxy fatty acid; reacting a barium alcoholate with an alkyl ester of a monochloro fatty acid. No. 1,987,121. Carl J. Malm and Gale F. Nadeau, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Production thermoplastic products from caoutchouc; using phosphorus oxychloride in presence of benzene. No. 1,987,171. Erwin Walz, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Apparatus for clay-treating oils. No. 1,987,175. Victor G. Benjamin, Los Angeles, Cal.

Continuous oxidation of paraffin hydrocarbons of high molecular weight by means of a gaseous oxidizing agent. No. 1,987,208. Ernst Peukert, Neuroessen, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture alkylene chlorhydrins and aliphatic esters conjointly. No. 1,987,227. Edgar C. Britton, Gerald H. Coleman, and Garnett V. Moore, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Manufacture glycerine by fermentation of carbohydrates in presence of a soluble sulfite and a soluble bisulfite. No. 1,987,260. Cecil Herbert Lilly, Saltcoats, Scotland, to Imperial Chemical Industries, Ltd., London, England.

Preservation fatty oils, fatty esters, fatty acids and fatty acid salts. No. 1,987,321. Wm. S. Calcott and Wm. A. Douglass, Pennsgrove, N. J., and Herbert W. Walker, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Apparatus for carbonating and cooling. No. 1,987,323. Leigh C. Carroll and Charlie W. Lovelace, Kansas City, Mo.

Manufacture waterproof abrasive fabric, having flexible character; using film of polymerized oil, lead linoleate, and cobalt linoleate. No. 1,987,467. Frank Joseph Crupi, Brookyn, N. Y., to Behr-Manning Corp., Brooklyn, N. Y.

Manufacture white Portland cement in a rotary kiln; using raw materials poor in Fe oxide, and treating clinker with acids. No. 1,987,485. Jean Mercelis, Antwerp, Belgium.

Manufacture high molecular sulfides of the aliphatic series. No. 1,987,526. Eberhard Elbel and Alfred Kirstahler, Dusseldorf, Germany, to Henkel & Cie, G. m.b.H., Dusseldorf, Germany.

Manufacture expansion joint filling material; comprising reaction product of a vegetable oil, drying oil, a vulcanizing agent, rosin, silica, and blown asphalt. No. 1,987,530. John S. Hipple, Temple, Pa.

Manufacture phenyl substituted fatty acid esters of aminoalcohols. No. 1,987,546. Andre Blankart, Basel, Switzerland, to Hoffmann-LaRoche, Inc., Nutley, N. J.

Preparation concentrated solution of ammonium nitrate; reacting ammonia with solution of nitric acid. No. 1,987,552. Giacomo Fauser, Novara, Italy, to Montecatini, Societa Generale per l'Industria Mineraria Ed Agricola, Milan, Italy.

Production aliphatic alcohols; heating mixed anhydrides of aliphatic carboxylic acids and weak inorganic oxygen containing acids together with hydrogen in presence of a hydrogenating catalyst. No. 1,987,558. Anton Hintermaier, Dusseldorf, Germany, to Henkel & Cie., G. m.b.H., Dusseldorf, Germany.

Production boron tricarboxylates; using carboxylic acid, an inorganic boron compound, and acetic acid anhydride. No. 1,987,559. Anton Hintermaier, Dusseldorf, Germany, to Henkel & Cie., G. m.b.H., Dusseldorf, Germany.

Manufacture ammonium chloride; by reacting gaseous ammonia and hydrogen chloride in a rapidly flowing continuously recirculated gaseous current. No. 1,987,572. Sheldon B. Heath, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Apparatus for treatment with solvents. No. 1,987,586. Clarence F. Dinley, Detroit, Mich., to James H. Bell, Phila., Pa.

Normally stable heat coagulable composition comprising rubber latex and heat-activable complex zinc ion. No. 19,426. Reissue. Stephen B. Neiley, Winchester, Mass., to Dewey & Almy Chemical Co., Cambridge, Mass.

Purification an aldehyde contaminated lower aliphatic alcohol: by bringing a monoamine into contact with the alcohol. No. 1,987,601. Jos. P. Burke, Highland Park, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production aluminum chloride and a metal below aluminum in the electro-motive series of the metals. No. 1,987,629. Claude G. Miner, Berkeley, Cal., one-half to Dudley Baird.

Production carbon black by thermal decomposition; mixing a hydrocarbon gas to be decomposed with at least twice its volume. No. 1,987,643. Ellwood B. Spear, Milford, N. H., and Robert L. Moore, Mt. Lebanon, Pa., to Thermatomic Carbon Co., New York, N. Y.

Production carbon black characterized by: 1. apparent density of order of 0.37; 2. maximum loading value in rubber when compounded therewith as a reinforcing agent of in excess of 100 but not substantially in excess of 150. No. 1,987,644. Ellwood B. Spear, Milford, N. H., and Robert L. Moore, Mt. Lebanon, Pa., to Thermatomic Carbon Co., New York, N. Y.

Mixing apparatus for plastics. No. 1,987,659. Fernley H. Banbury, Ansonia, Conn.

Preparation naphthoic acid derivative. No. 1,987,669. Miles A. Dahlen, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation a cellulose ether in which the ether is obtained from the etherification reaction in a gummy condition difficult to purify. No. 1,987,672. Deane C. Ellsworth, Kenmore, N. Y., to du Pont Rayon Co., New York, N. Y.

Mercury vapor heating apparatus. No. 1,987,715. Frank Short, Poughkeepsie, N. Y., to Chemical Machinery Corp., New York, N. Y.

Colloid mill with three concentrically-arranged film shear producing members, including a stator and two rotors. No. 1,987,724. Chas. P. Tolman, Kew Gardens, N. Y., to Noble & Wood Machine Co., Hoosick Falls, N. Y.

Manufacture ceramic bonded abrasive; using refractory granular material and a ceramic silicate bond that includes at least 1% of phosphoric oxide and alumina in its chemical composition. No. 1,987,861. Lowell H. Milligan and David Armitage, Worcester, Mass., to Norton Co., Worcester, Mass.

Heat exchanger apparatus of the tubular type. No. 1,987,891. Fred. W. Cattanach, Cranford, N. J., to C. H. Leach Co., New York, N. Y.

Production denatured alcohol containing oils derived from the acid sludge formed during sulfuric acid treatment of hydrocarbon oil. No. 1,988,007. Wm. H. Hampton, Berkeley, Cal., to Standard Oil Co. of Cal., San Francisco, Cal.

Production unsaturated ketones. No. 1,988,021. Otto Schmidt and Karl Huttner, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Process for separation from acetylene of other strongly unsaturated compounds contained in a gas issuing from a thermal dissociation of a vaporized hydrocarbon product. No. 1,988,032. Paul Baumann, Hanns Bueckert, Ludwigshafen-am-Rhine, Wilhelm Sandhaas, Mannheim, and Heinrich Schilling, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Process converting phosphatides into powdered phosphatide preparations; adding phosphatide to a neutral liquid and mixing with dried purified and ground germs. No. 1,988,050. Richard Rosenbusch and Gustav Reverey, Steglitz, near Berlin, Germany.

Process for concentrating carbonate and oxidized ores and minerals; by final subjection to a froth-flotation process in presence of a nitrogen-containing but carbon-free derivative of a thiophosphoric acid. No. 1,988,052. Wilhelm Schafer, Bochum, Germany, to Erz- und Kohle-Flotation G. m.b.H., Bochum, Germany.

Manufacture per-salts by anodic oxidation of an alkali metal salt in presence of a cathode consisting essentially of an alloy selected from the group of nickel, chromium, and iron. No. 1,988,059. Johannes van Loon, Deventer, Netherlands.

Recovery beryllium compounds; condensing beryllium chloride into a solution of desired composition. No. 1,988,109. John E. Bucher, Yellow Springs, Ohio, to Antioch Industrial Research Institute, Inc., Yellow Springs, O.

Preparation magnesium oxide-magnesium chloride composition which, with the addition of water, yields product for painting which will set and dry without objectionable shrinking and cracking; using magnesium oxide, magnesium chloride, and pyrophyllite. No. 1,988,125. Cleo H. Kidwell, Dongan Hills, S. I., N. Y., to R. T. Vanderbilt Co., New York, N. Y.

Manufacture emulsion; fluxing rubber with a bitumen, then dispersing fluxed material in an aqueous vehicle by means of a colloid. No. 1,988,126. Lester Kirschbraun, New York, N. Y., to Patent & Licensing Corp., New York, N. Y.

Production arsenic esters; heating arsenious oxide and a polyglycol. No. 1,988,176. David R. Merrill, Long Beach, Cal., to Union Oil Co., of Cal., Los Angeles, Cal.

Production mixture of isopropanolamines which contain more than 90% of trisopropanolamine. No. 1,988,225. Jacob N. Wickert, So. Charleston, W. Va., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Composition adapted for cooling and electrical insulating purposes; consisting of mineral oil and a quantity of a reagent sufficient to effectively retard sludging of oil. No. 1,988,300. Frank M. Clark, Pittsfield, Mass., to General Electric Co., New York, N. Y.

Apparatus for removing tramp or stray iron or impurity from bagasse and other materials of like consistency. No. 1,988,324. Francis Maxwell, Westminster, London, England.

Preparation bituminous frostproof emulsion; consisting of bitumen in the dispersed phase, water in the continuous phase, and B Rosin soap as the emulsifying agent. No. 1,988,336. Jos. C. Roediger, Brooklyn, N. Y., to The Patent & Licensing Corp., New York, N. Y.

Apparatus and process for making laminated vulcanized fibre. Wm. M. Shoemaker, Jr., Kennett Square, Pa., to National Vulcanized Fibre Co., Wilmington, Del. No. 1,988,340.

Production clear, homogeneous soluble artificial masses; using a neutral ester of a polyhydric alcohol, an organic acid, a neutralized condensation product, and a phenol. No. 1,988,353. Herbert Honel, Klosterneuburg-Weidling, near Vienna, Austria, to Beck, Koller & Co., Inc., Detroit, Mich.

Production soluble artificial resinous masses; obtained by reacting together a product obtained by esterifying carboxylic acids with both monohydric and polyhydric alcohols, a neutralized condensation product, and a phenol. No. 1,988,354. Herbert Honel, Klösterneuburg-Weidling, near Vienna, Austria, to Beck, Koller & Co., Inc., Detroit, Mich.

Apparatus and method for separating materials of differing specific gravities. No. 1,988,371. Henry M. Chance, Phila., Pa.

Production phosphorus; heating reaction mixture of phosphate and reducing agent in a reaction chamber. No. 1,988,387. Arthur J. Mason, Homewood, Ill., Continental Illinois National Bank and Trust Co. of Chicago, executor of estate of said Arthur J. Mason, deceased.

Waterproof electric and heat insulating material resistant to acids and alkalies. No. 1,988,420. Frank W. Jackson, Revere, Mass., to Irving G. Siligman, Dorchester, Mass.

Casting mold. No. 1,988,425. David L. Sumney, Waterbury, Conn., Colonial Trust Co. and Richard P. Weeks Sumney, executors of said David L. Sumney, deceased, to Scovill Mfg. Co., Waterbury, Conn.

Method reacting acetylene and oxygen for preparation glyoxal, heating mixed gases in presence of a catalyst. No. 1,988,455. Samuel Lenher, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation heat-hardening oil compositions; heating a solution of a novolak in a fatty oil, thereafter adding a hardening agent, finally heating at a stage where product is soluble in oil of turpentine. No. 1,988,465. Fritz Seebach, Erkner, near Berlin, Germany, to Bakelite G. m.b.H., Berlin, Germany.

Manufacture corn gluten plastic. No. 1,988,475. Henry Berlin, New York, N. Y., to Resinox Corp., New York, N. Y.

Manufacture luminous material; two sheets flexible transparent cellulosic material joined together by an adhesive containing a luminescent material. No. 1,988,476. Jacques Edwin Brandenburger, Neuilly, France, to Du Pont Cellophane Co., New York, N. Y.

Preparation filtering medium; comprising a bonded aggregate, the particles of the aggregate being embedded in a porous bond. No. 1,988,478. Bartley E. Boardwell, Lewiston, and Leroy C. Werking, Niagara Falls, N. Y., to National Carbon Co., New York, N. Y.

Method oxidizing secondary alcohols to ketones. No. 1,988,481. Eugene J. Cardarelli, Newark, N. J., to Standard Alcohol Co., Wilmington, Del.

Production 5-nitro-1-naphthylamine and 1, 8-dinitro-naphthalene. No. 1,988,493. Herbert Henry Hodgson, Bradford, England, to Imperial Chemical Industries, Ltd., London, England.

Treatment an aqueous suspension of spirit nigrosine having an acid reaction to Congo red test paper, with a small amount of an inorganic acid-binding agent. No. 1,988,499. Spencer Christian Kimmel, Buffalo, N. Y., to National Aniline & Chemical Co., New York, N. Y.

Preparation an aryl thioglycollic acid. No. 1,988,501. Herbert August Lubs and Arthur Lawrence Fox, Wilmington, Del., and Robert Archie Smith, Pennsgrove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process separating magnesia in the form of magnesium carbonate from a mixture of magnesium oxide and calcium carbonate. No. 1,988,524. Horace E. Stump, Lakeville, Conn.

Preparation low viscosity vinyl polymers. No. 1,988,529. James H. Werntz, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production mixed cellulose esters; reacting cellulose nitrate with an anhydride of an organic acid. No. 1,988,532. David R. Wiggam and John S. Tinsley, Kenvil, N. J., to Hercules Powder Co., Wilmington, Del.

Process mixing mineral materials with a bituminous substance; adding aqueous paste of humic acid to minerals before they are mixed with bituminous agent. No. 1,988,543. Karl Daimler, Frankfort-am-Main-Hochst, Germany, to I. G., Frankfort-am-Main, Germany.

Preparation homogeneous permanently stable liquid; comprising ethylene glycol, an oleaginous material containing lard oil which contains free fatty acid together with ethanolamines. No. 1,988,584. Leo I. Dana and Carl W. Giorgi, Buffalo, N. Y., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Production isopropyl alcohol from propylene; bringing sulfuric acid into contact with propylene in the liquid state and distilling the product. No. 1,988,611. Wm. H. Shiffler and Melvin M. Holm, Berkeley, and Ward P. Anderson, Richmond, Cal., to Standard Oil Co. of Cal., San Francisco, Cal.

Preparation organic arsenic compound. No. 1,988,758. Karl Streitwolf, Frankfort-am-Main, Alfred Fehrle, Bad-Soden-on-Taunus, and Hubert Oesterlein, Frankfort-am-Main-Hochst, Germany, to Winthrop Chemical Co., New York, N. Y.

Production mixture of nitrogen and hydrogen. No. 1,988,781. Geo. W. Burke, Westfield, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture manganese dioxide. No. 1,988,799. Yogoro Kato, Ebara-Gun, Tokyo-Fu, Japan, fifty per cent. to Kaoru Oyama, representative director of Yuasa Storage Battery Co., Ltd., Osaka-Fu, Japan.

Manufacture clay product for use in vitreous enameling and a glazing; mixing plastic clay and a water-insoluble metal hydroxide, then partly drying. No. 1,988,800. Chas. J. Kinzie, Chas. H. Commons, Jr., and Donald S. Hake, Niagara Falls, to Titanium Alloy Mfg. Co., New York, N. Y.

Production purified alkyl esters of the aliphatic monocarboxylic acids. No. 1,988,801. Robert B. Lebo and Clayton M. Beamer, Elizabeth, N. J., to Standard Alcohol Co.

Production benzoic acid; involving catalytic oxidation of naphthalene to phthalic anhydride. No. 1,988,876. Max Scharff and Johannes Brode and Josef Reichart, Ludwigshafen-am-Rhine, Adolf Johannsen, Mannheim, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture solid, stable crystalline additive products of sodium hypochlorite and alkaline salts of alkaline reaction which are capable of combining with water of crystallization. No. 1,988,991. Franz Albertshauser, Muttenz-Basselland, Switzerland, to Henkel & Cie., G. m.b.H., Dusseldorf, Germany.

Process rendering a solid carbonaceous fuel permanently dustless; distributing over it an aqueous composition containing as an active ingredient alkaline black liquor by-product. No 1,988,999. Noel Cunningham, Bethlehem, Pa., and Chas. Lee Peck, Mt. Vernon, N. Y., to Champion Fibre Co., Ohio.

Removal impurities from gases; scrubbing gases with a solution containing an ethanolamine and a metallic compound. No. 1,989,004. Harvey R. Fife, Pittsburgh, Pa., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Manufacture petroleum plastic free from asphaltines. No. 1,989,045. David R. Merrill, Long Beach, Cal., to Union Oil Co. of Cal., Los Angeles, Cal.

Dehydrating apparatus. No. 1,988,677. Gerald D. Arnold, Galesville, Wis.

Patents—Fine Chemicals

Preparation mercury compound of a nitro-paracresol; characterized by high bactericidal and bacteriostatic value. No. 1,985,949. Geo. W. Raiziss, Phila., Pa., to Abbott Labs., No. Chicago, Ill.

Purification by sublimation; method subliming salicylic acid. No. 1,987,301. John W. Livingston, Kirkwood, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Production organic mercury compounds; heating mercuric salt in presence of a solvent with an unsubstituted hydrocarbon derivative of a tetravalent metal. No. 1,987,685. Morris S. Kharasch, Chicago, Ill., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production synthetic camphor; using bornyl chloride, aniline, aniline hydrochloride, camphene, sulfur, and a water solution of an acid. No. 1,987,750. John J. Ritter, Yonkers, N. Y.

Preparation a quinine hydrochloric mercury bichloride. No. 1,988,374. Wm. Craig, Joplin, Mo.

Production potassium stannic pyrocatechin disulfonate; being a whitish water soluble powder. No. 1,988,575. Hans Schmidt, Vohwinkel, near Elberfeld, Germany, to Winthrop Chemical Co., New York, N. Y.

Preparation complex compounds of pentavalent antimony; reacting upon a polyhydroxy benzene compound with an antimony compound, in presence of water. No. 1,988,576. Hans Schmidt, Elberfeld-Vohwinkel, Germany, to Winthrop Chemical Co., New York, N. Y.

Patents—Coal-Tar

Preparation acridine compounds from polyamino-diphenylmethane compounds free from amino groups that contain substituents. No. 1,986,111. Frederick H. Kranz, Buffalo, N. Y., to National Aniline & Chemical Co., New York, N. Y.

Conducting chemical reactions in alkaline media in the manufacture of phenol. No. 1,986,194. John J. Grebe and John H. Reilly, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Phenol recovery process; treating phenol-bearing liquor with mixture of water immiscible phenol-absorbing oxygenated organic compounds. No. 1,986,320. Chas. L. Burdick, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Prevention gum formation in gas distribution systems; contacting gum forming compound of the combustible gas with mono or poly hydric derivatives of benzene or its homologs. No. 1,986,333. Walter H. Fulweiler, Wallingford, Pa., to United Gas Improvement Co., Phila., Pa.

Process purifying an impure N-mono-ethyl aromatic amine of the benzene series. No. 1,986,411. Ernest Harry Rodd and Reginald Wm. Everatt, Blackley, Manchester, England, to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process condensing a phenol and a member of the class consisting of aldehydes of at least 2 carbon atoms, and ketones in presence of an acid condensing medium by including an acid-soluble boron compound in the reaction mixture. No. 1,986,423. Jas. A. Arvin, Wilmington, Del., to E. I. du Pont de Nemours Co., Wilmington, Del.

Preparation a solution of the sodium salt of diaminodioxyarsenobenzene-methylene-sulfoxyl acid in stable, immediately usable form. No. 1,986,749. Baptist Reuter, Krailling-Planegg, Germany.

Halogenation of amino-anthraquinone compounds, carrying out halogenation in nitrobenzene and a metal chloride. No. 1,986,798. Wm. Dettwyler, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Coke oven. No. 1,986,830. Heinz Leithauser, Essen-Ruhr, Germany, to Koppers Co. of Delaware, Pittsburgh, Pa.

Coke oven. No. 1,986,903. Friedrich Totzek, Essen-Stoppenberg, Germany, to Koppers Co. of Delaware, Pittsburgh, Pa.

Regenerative coke oven battery. No. 1,986,904. Friedrich Totzek, Essen-Stoppenberg, Germany, to Koppers Co. of Delaware, Pittsburgh, Pa.

Manufacture quinhydrone; condensing quinone vapors with a solution of hydroquinone. No. 1,987,148. Karl Christian Kleimenhagen, La Salle, Ill., to Carus Chemical Co., La Salle, Ill.

Preparation mixed isomeric octylphenols and ethers. No. 1,987,228. Herman A. Bruson, Phila., Pa., to Resinous Products & Chem. Co., Phila., Pa.

Preparation 2-alkylaminobenzene-1-carboxylic acid-4-sulfonic acids. No. 1,987,266. Anton Ossenbeck, Cologne-Mulheim, and Ernst Tietze, Cologne-am-Rhine, Germany, to General Aniline Works, Inc., New York, N. Y.

Preparation N-mono-alkyl amino-hydroxy naphthalene derivatives. No. 1,987,317. Adolph Zimmerli, New Brunswick, N. J.

Preparation phenols; first step causing a current of steam to pass through phenates in the fused condition in a practically dry state. No. 1,988,156. Maurice Ernest Bouvier, Lyon, and Louis Dominique Bardin, Venissieux, France, to Societe des Usines Chimiques Rhone-Poulene, Paris, France.

Manufacture beta-iodo-hydroxynaphthalenedisulfonic acids. No. 1,988,222. Arthur Stoll, August Binkert, and Walter Kussmaul, Basel, Switzerland, to Chemical Works formerly Sandoz, Basel, Switzerland.

Production an aryl-peri acid; reacting peri acid with a primary aromatic amine in the absence of a salt of the amine with an inorganic acid. No. 1,988,719. Wm. J. Cotton, Buffalo, N. Y., to National Aniline & Chem., Co., New York, N. Y.

Preparation a complex sulfocyanate of an amine; incorporating a sulfocyanic acid radical with an amine. No 1,988,826. Martin Battegay, Mulhouse, France, to Calco Chemical Co., Bound Brook, N. J.

Manufacture nitrogeneous polymerization products which are probably triazine derivatives. No. 1,989,042. Max Albert Kunz, Mannheim, and Karl Koeberle and Erich Berthold, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, New York, N. Y.

Preparation diazo-types and light-sensitive layers. No. 1,989,065. Maximilian Paul Schmidt, Oskar Sus, and Robert Franke, Wiesbaden-Biebrich, Germany, to Kalle & Co., Aktiengesellschaft, Wiesbaden-Biebrich, Germany.

Patents—Dyes

Production oil-soluble azo dye; comprising xylyl-azo-xylyl-azo-beta-naphthol, of which at least 50% of the xylyl radicals are derivatives of o-xylene. No. 1,986,116. Ralph B. Payne, Elma, N. Y., to National Aniline & Chemical Co., New York, N. Y.

Process for coloration of cellulose derivatives, coloring the materials with water-insoluble azo dyes. No. 1,986,801. Geo. Holland Ellis, Spondon, near Derby, England, to Celanese Corp. of America, Delaware.

Preparation dyeing materials, comprising organic substitution derivatives of cellulose. No. 1,986,883. Geo. Holland Ellis and Henry Chas. Olpin, Spondon, near Derby, England, to Celanese Corp. of America, Delaware.

Manufacture water-soluble anthraquinone dyestuffs; which, in dry state, are dark blue powders. No. 1,987,538. Albin Peter, Basel, Switzerland, to "Chemical Works formerly Sandoz," Basel, Switzerland.

Sulfur dyestuff preparations for printing textile fibers, comprising Indocarbon, CL, an alcohol and a salt-like hydrotropically acting agent. No. 1,987,583. Hermann Berthold, Leverkusen-I. G. Werk-am-Rhine, Germany, to General Aniline Works, New York, N. Y.

Production thiazole dye. No. 1,987,614. Arthur L. Fox, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production alpha-aminoanthraquinone dyestuffs. No. 1,987,747. Paul Nawiasky and Otto Grosskinsky, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, New York, N. Y.

Production vat dyestuffs consisting of 3, 4, 8, 9-dibenzopyrene-5, 10-quinones. No. 1,988,205. Max Albert Kunz, Mannheim; Georg Kranzlein, Martin Corell, and Heinrich Vollmann, Frankfort-Hochst-am-Rhine; Karl Koeberle, and Erich Berthold, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, New York, N. Y.

Dyeing apparatus. No. 1,988,364. Geo. W. Steiger, Jackson Heights, N. Y., to H. W. Butterworth & Sons Co., Phila., Pa.

Production vat dyestuffs of the acridone and thioxanthone series. No. 19,437. Reissue. Paul Nawiasky and Emil Krauch, Ludwigshafen-am-Rhine, Wilhelm Bauer, Leverkusen, to General Aniline Works, New York, N. Y.

Preparation lubricating oil dye stock. No. 1,988,753. Sherman S. Shaffer and Egi V. Fasce, Baytown, Tex., to Standard Oil Development Co., Bayways, N. J.

Patents—Agricultural Chemicals

Producing fungicides and insecticides; sulfonating beta naphthol and condensing with formaldehyde, causing synthetic tanning agent so produced to interact with a heavy metal oxide. No. 1,986,044. Vittorio Casaburi, Naples, Italy.

Preparation insecticide and fungicide in the form of a substantially dry dust. No. 1,986,218. Theron P. Remy, Los Angeles, Cal., to Texas Co., New York, N. Y.

Manufacture phosphate fertilizer; reacting phosphatic material and a strong liquid acid. No. 1,986,293. Mark Shoeld, Mt. Lebanon, Pa., to Oberphos Co., Balto., Md.

Dusting powder for insecticidal and/or fungicidal use; using dessicated milk and molasses in powdered form. No. 1,987,005. Wm. A. Forbes, San Francisco, Cal.

Manufacture insecticide containing lead arsenate and lead cyanide. No. 1,987,?91. Wm. McIlvaine Dickson, Woodside, Del., to General Chemical Co., New York, N. Y.

Preparation insecticide; comprising an emulsion of asphalt, water, a water insoluble toxic compound and an emulsifier; insecticide being adapted to prevent termite infestation. No. 1,988,175. David R. Merrill, Long Beach, Cal., to Union Oil Co., of Cal., Los Angeles, Cal.

Preparation insecticide and wood preservative; comprising a hydrocarbon diluent and arsenic ester. No. 1,988,177. David R. Merrill, Long Beach, Cal., to Union Oil Co. of Cal., Los Angeles, Cal.

Preparation insecticide and wood preservative; composed of asphalt and Edelneau extract. No. 1,988,178. David R. Merrill, Long Beach, Cal., to Union Oil Co. of Cal., Los Angeles, Cal.

Production ammonium sulfate; first injecting ammonia and sulfuric acid into a fluid stream in a cyclic system at the lowest point in said system. No. 1,988,701. Frederic Marnus Pyzel, Piedmont, Cal., to Shell Development Co., San Francisco, Cal.

Preparation fungicide; comprising a complex copper ammonium silicate compound. No. 1,988,752. Alwyn C. Sessions, New Brunswick, N. J., to Stanco, Inc., New York, N. Y.

Patents—Chemical Specialties

Composition for preventing silver from tarnishing; comprising solid lumps of a porous deliquescent anhydrous dehydrating material having an affinity for carbon dioxide. No. 1,985,900. Israel S. Kleiner, Brooklyn, N. Y.

Manufacture an emulsified, neutral, non-saponaceous cleaning and polishing composition; using a mineral oil, water, gum tragacanth, a mild abrasive, and glycerin. No 1,986,243. Maurice H. Arveson, Hammond, Ind., to Standard Oil Co., Whiting, Ind.

Composition for use in laundering; using water solution of a simple neutral salt of a weak metallic base and a strong acid. No. 1,986,286. Silas M. Ratzkoff, Phila., Pa., to Publicker Research & Development Co., Phila., Pa.

Polish for metallic surfaces; containing wax, a higher fatty acid dissolved in an organic solvent, an alkaline aqueous solution containing a cleaning agent, and a wetting out agent. No. 1,986,388. Wm. S. Calcott, Pennsgrove, N. J., and Richard G. Clarkson, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Polishing composition, comprising water, polishing wax, a softener, water insoluble solvent, and an emulsifying agent. No. 1,986,936. Wm. W. Lewers, Flint, Mich., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Dry dressing composition; being a compound having a fungicidal action, a water-soluble liquid compound of the formula R.O.R.', and an inert diluent, said composition having property of binding or laying dust. No. 1,988,757. Adolf Steindorff, Heinrich Rossner, and Kaspar Pfaff, Frankfort-am-Main, Germany, to Winthrop Chemical Co., New York, N. Y.

Composition for removal rust from metallic surfaces; using ammonium salt of a mineral acid, an alkali metal salt of a water-soluble organic acid, sugar, a protective colloid, and an inhibitor of corrosion. No. 1,988,823. Carl Winning and John Tuttle, Elizabeth, N. J., to Stanco, Inc., New York, N. Y.

Patents—Coatings

Coating composition, which when applied as thin film retains flexibility; containing a drying oil, accelerator of oxidation, and an aryl-substituted guanidine. No. 1,985,896. Jas. K. Hunt, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production flowable coating; using a drying oil, which is the total distillate obtained by distilling vulcanized rubber to dryness, a resin and a drier. No. 1,986,049. Taliaferro J. Fairley, Alexandria, La., one-half to W. J. Hunter and one-half to Mary P. Hunter, both of Shreveport, La.

Manufacture artificial leather; comprising a dried, bibulous web of unwoven cellulose fiber, impregnated with a mixture of water-dispersed rubber of the character of latex and viscose. No. 1,986,367. Milton O. Schur, Berlin, N. H., to Brown Co., Berlin, N. H.

Manufacture film comprising nitrocellulose and a reaction product miscible therewith. No. 1,986,787. Harold J. Barrett, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture coating composition; using a drying oil, glycerol, phthalic anhydride, and a heat polymerized drying oil. No. 1,986,930. John W. Iliff, Ridley Park, and Paul Robinson, Llanerch, Pa., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production coating composition; comprising a cellulosic derivative and a polyvalent metal salt of an organic acid. No. 1,987,570. Herman Alexander Bruson, Germantown, Pa., to Resinous Products & Chem. Co., Phila., Pa.

Production laminated material; first impregnating base sheets with phenol-aldehyde resin; third step washing sheets in aqueous alkaline liquid. No. 1,987,694. Gerald H. Mains, Murrysville, Pa., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Manufacture moisture-proof wrappers; fusing mixture of cellulose derivative, resin, plasticizer, and wax, and applying to a structureless foil while in a molten condition. No. 1,988,099. Richard Weingand and Joseph Seiberlich, Bomlitz, near Walsrode, Germany.

Preparation a liquid coating composition; using an oil-soluble phenol-aldehyde reaction product and China wood oil. No. 1,988,615. Victor H. Turkington, Caldwell, and Wm. H. Butler, Arlington, N. J., to Bakelite Corp., New York, N. Y.

Coating composition; containing emulsified asphalt, water and blue lead. No. 1,988,921. Leroy E. Seng, Cleveland Heights, Ohio, to Union Products Co., Cleveland, Ohio.
Process for applying gelatin coating to surfaces. No. 1,989,017. Henry Neumann, New York, N. Y.
Method coating pipe; using a layer of plastic bituminous mastic. No. 1,988,628. Chas. S. McDonald and Jos. F. Putnam, Berkeley, and Roy M. McHale, Oakland, Cal., to Standard Oil Co. of Cal., San Francisco, Cal.
Synthetic resin composition; resulting from combination of a polymerized aldehyde resin free from vinyl ester and solid, and a polymerized product. No. 1,985,993. Willy O. Herrmann, Hans Deutsch, and Wolfram Haehnel, Munich, Germany, to Chemische Forschungsgesellschaft, m.b.H., Germany.

Patents—Paints, Varnishes, Lacquers, etc.

Method incorporating pigments in oil. No. 1,986,029. Jas. D. Todd and Max Silverman, Chicago, Ill., to Sherwin-Williams Co., Cleveland, Ohio.
Preparation varnish gum; subjecting vulcanized rubber to destructive distillation and using nitric acid. No. 1,986,051. Taliaferro J. Fairley, Alexandria, La., one-half to W. J. Hunter and one-half to Mary P. Hunter, both of Shreveport, La.
Manufacture pigment; consisting of a mechanical admixture of calcined zinc sulfide pigment and uncalcined calcium sulfate pigment. No. 1,986,183. Earl H. Bunce, and Geo. F. A. Stutz, Palmerton, Pa., to New Jersey Zinc Co., New York, N. Y.
Preparation modified drying oil, which is adapted, in the presence of a drier, to dry to a non-tacky surface. No. 1,986,571. Henry A. Gardner, Washington, D. C.
Method applying a penetrative oil-synthetic resin varnish to surface of a porous material without any substantial penetration of porous material by the varnish. No. 1,987,549. Robt. P. Courtney, Maplewood, N. J., to Bakelite Corp., New York, N. Y.
Production black lacquer; using either nitrocellulose or resin or both, carbon black, a copper salt soluble in the mill charge, and a volatile solvent. No. 1,987,980. Carl W. Sweitzer, Pittsburgh, Pa., to Columbian Carbon Co., New York, N. Y., and Binney & Smith Co., New York, N. Y.
Production soluble artificial masses suitable as bases for varnish manufacture. No. 1,988,355. Herbert Honel, Klosterneuburg-Weidling, near Vienna, Austria, to Beck, Koller & Co., Inc., Detroit, Mich.
Production clear homogeneous artificial masses suitable as bases for varnish manufacture. No. 1,988,356. Herbert Honel, Klosterneuburg-Weidling, near Vienna, Austria, to Beck, Koller & Co., Detroit, Mich.
Production paint for application to porous surfaces, such as felt base surface coverings; polymerizing a completely liquid phase of a mixture of drying oils using a synthetic resin and incorporating pigment in final step. No. 1,988,959. Philip H. Pennell and Chas. H. Draper, Manheim Township, Lancaster Co., Pa., to Armstrong Cork Co., Lancaster, Pa.

Patents—Glass

Apparatus for making laminated glass. No. 1,987,306. Frank R. Murphy, Chicago, Ill., to J. P. Devine Mfg. Co., Chicago, Ill.
Production laminated glass; preparing a bond-inducing medium by first mixing rubber and gelatin, then dissolving 10 to 20% of this mixture in diethylene glycol, and applying to the laminations. No. 1,982,712. Geo. B. Watkins, Toledo, O., to Libbey-Owens-Ford Glass Co., Toledo, O.
Coloring agents for glass batches; being usual cadmium sulfide preparation, with an addition of material from the group of metallic cadmium, cadmium selenide, and cadmium sulfo-selenide. No. 1,983,151. Alexander Silverman, Pittsburgh, Pa.
Apparatus for sealing laminated glass. No. 1,983,156. George B. Watkins and Ray W. Wampler, Toledo, Ohio, to Libbey-Owens-Ford Glass Co., Toledo, Ohio.
Process purification sand for glass manufacture; final step being acid leaching of the sand. No. 1,983,272. Theodore Earle, Denver, Colo.
Manufacture ultra violet ray transmitting glass; adding to ordinary glass composition 1 to 5% sodium fluoride and 1 to 5% ammonium oxalate. No. 1,983,359. Kitsuzo Fuwa and Fujio Suzuki, Tokyo, Japan, to General Electric Co., Schenectady, N. Y.
Manufacture splinterless glass, having, as binding agent for securing adhesion of the sheets of glass, a condensation product of maleic acid and 1.3 glycols. No. 1,984,671. Karl Daimler and Gerhard Balle, Frankfort-am-Main-Hochst, Germany, to I. G., Frankfort-am-Main, Germany.
Apparatus for making insulating glass. No. 1,984,942. William Owen, Pittsburgh, Pa., to Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Apparatus for making insulating glass. No. 1,984,924. John H. Fox, Pittsburgh, Pa., to Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Apparatus and method for cutting laminated glass. No. 1,985,520. Conrad B. Schafer, Toledo, Ohio, to Libbey-Owens-Ford Glass Co., Toledo, Ohio.

Patents—Cellulose

Process mechanically reducing cellulose pulp to a mass of substantially unhydrated particles. No. 1,986,341. Roger B. Hill, Peabody, Mass., to Brown Co., Berlin, N. H.
Manufacture artificial threads or fibers formed of an organic derivative of cellulose sized with a composition substantially free from siccatives and consisting of a blown drying oil and an anti-oxidant. No. 1,986,349. Guillaume Lardy, Caluire, France, to Du Pont Rayon Co., New York, N. Y.
Manufacture viscose products; adding to a viscose solution an ammonium compound which reacts upon the viscose to produce a volatile sulfur compound. No. 1,986,366. Milton O. Schur, Berlin, N. H., to Brown Co., Berlin, N. H.
Apparatus and process for digesting wood and other cellulose-containing fibrous material. No. 1,986,760. Otto Kreissler, Frankfort-am-Main, Griesheim, Germany, to American Lurgi Corp., New York, N. Y.
Preparation cellulose derivative compositions; comprising a cellulose derivative and a polyalkylamide of an organic carboxylic acid. No. 1,986,854. Ebenezer Emmet Reid, Balto., Md., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Production cellulose acetate; esterifying cellulose containing excess water by means of acetic anhydride in presence of ferric chloride. No. 1,986,880. Henry Dreyfus, London, England.
Production cellulose derivatives having an affinity for acid dyestuffs; acting an aqueous solution of an amine on hydroxy groups until product contains fixed nitrogen. No. 1,986,881. Henry Dreyfus, London, England.
Manufacture of at least one body of formula R.CHO (where R is a hydrogen atom or a methyl group). No. 1,986,885. Donald Finlayson and John Herbert Geoffrey Plant, Spondon, near Derby, England, to Celanese Corp. of America, Delaware.
Production composition by subjecting cellulosic material to acetylation treatment. No. 1,986,908. Victor Emmanuel Yarsley, Ewell, England, one-half to Cellulose Acetate Silk Co., Ltd., Lancaster, England.
Manufacture a thin moistureproof cellulose acetate wrapping; final step being application of a gum-wax overcoating. No. 1,987,045. Norman F. Beach, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.
Manufacture cellulose esters; comprising acylating cellulose with a reaction mixture. No. 1,987,053. Hans T. Clarke, New York, and Carl J. Malm, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.
Process decolorizing cellulose nitrate; subjecting sheeting to bleaching action of an alkali metal hypochlorite solution, then treating with an alcoholic solution of caustic alkali. No. 1,987,077. Marvin J. Reid, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.
Manufacture homogeneous artificial compositions; using water-insoluble derivative of cellulose and a viscoloid polymerization product of an alkylene oxide. No. 1,987,114. Leo Kollek, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.
Process fusing an organic ester of cellulose; subjecting the ester in presence of a non-solvent liquid to elevated temperatures and pressures until fusion occurs. No. 1,987,610. Camille Dreyfus, New York, N. Y., and Geo. Schneider, Montclair, N. J., to Celanese Corp., of America, Delaware.
Manufacture supports of cellulose derivatives for use in manufacture of sheets of material soluble in organic solvents. No. 1,988,550. Werner Gladhorn, Dessau in Anhalt, Germany, and Leopold Eckler, Binghamton, N. Y., to Agfa Ansco Corp., Binghamton, N. Y.

Patents—Rubber

Process treating vulcanized rubber by destructive distillation. No. 1,986,050. Taliaferro J. Fairley, Alexandria, La., one-half to W. J. Hunter and one-half to Mary P. Hunter, both of Shreveport, La.
Preparation composition comprising rubber compounded with a coal-tar oil. No. 1,986,389. Arthur Burnham Cowdery, Needham, Mass., and Theo. A. Bulifant, Maywood, N. J., to Barrett Co., New York, N. Y.
Process rubber vulcanization; heating rubber and sulfur in presence of an accelerator. No. 1,986,463. Chester W. Christensen, Akron, Ohio, to Rubber Service Labs., Akron, Ohio.
Preparation a concentrated rubber latex, containing a pectin body. No. 19,434. Reissue. John McGavack, Leonia, N. J., to U. S. Rubber Co., New York, N. Y.
Production compounds suitable for rubber vulcanization; obtained from treating a preformed heptaldehyde and aniline condensation product with a strong mineral acid. No. 1,988,438. Sidney M. Cadwell, Grosse Pointe Village, Mich., to U. S. Rubber Co., New York, N. Y.
Manufacture vulcanized fiber, bonded while containing disseminating water, by a water-borne agent which is water-insoluble as finally dehydrated. No. 1,988,441. John K. Anthony, Cleveland Heights, Ohio, to Horace B. Fay, Cleveland, Ohio.
Production conversion products of rubber; acting on a rubber material with an aliphatic per-carboxylic acid. No. 1,988,448. Heinrich Hopff, Friedrich Ebel, and Emerich Valko, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.
Production colored rubber; incorporation the leuco compound of a dye with a rubber latex, coagulating latex, oxidizing leuco compound, and vulcanizing. No. 1,988,483. Elmer G. Croakman, Akron, O., to National Aniline & Chemical Co., New York, N. Y.
Process coloring rubber; mixing leuco compound of a dye with a mix containing a solid unvulcanized rubber substance. No. 1,988,484. Elmer G. Croakman, Akron, O., to National Aniline & Chemical Co., New York, N. Y.
Preparation working up vulcanized rubber waste. No. 1,988,902. Franz Keppeler, Berlin-Weissensee, Germany.

Patents—Paper and Pulp

Method treating waste paper; using water, kerosene, bentonite, and soda ash. No. 1,986,907. Sidney D. Wells, Port Edwards, Wis.
Treatment wood pulp with bleach liquor containing hypochlorite to whiten pulp without physical or chemical degradation of fibers, then treating with permanganate. No. 1,987,212. Geo. A. Richter, Berlin, N. H., to Brown Co., Berlin, N. H.
Cyclic chemical pulping process involving the repeated cooking of raw cellulosic material in liquors containing caustic soda as a principal fiber-liberating chemical. No. 1,987,214. Geo. A. Richter, Berlin, N. H., to Brown Co., Berlin, N. H.
Recovery fiber from waste paper; subjecting waste paper in wet pulp form to action of a deinking composition. No. 1,988,363. Francis H. Snyder, New York, N. Y., to Snyder MacLaren Processes, Inc., New York, N. Y.
Production marking compound for making carbon paper; composed of titanium oxide, mineral oil, and petroleum spirits. No. 1,988,723. Harold W. A. Dixon, Hollis, N. Y.

Patents—Water Treatment

Method sewage treatment. No. 1,986,332. Anthony J. Fischer, Jackson Heights, N. Y., to Dorr Co., Inc., New York, N. Y.
Apparatus for water softening. No. 1,986,774. Ferdinand L. Hopfer, St. Paul, Minn., one-third to Arthur E. Lux, White Bear Lake, Minn., and one-third to Wm. J. Lux, St. Paul, Minn.
Composition for preventing incrustation in water-containing systems; composed of an alkaline reacting sodium phosphate, a water soluble carbohydrate, and acid. No. 1,986,963. Wilson Evans, Hinsdale, Gail J. Fink, LaGrange, and Herbert A. Kern, Hinsdale, Ill., to National Aluminate Corp., Chicago, Ill.

Patents—Explosives

Manufacture explosive containing tetranitromethane and mononitroxylene. No. 1,985,968. Jos. A. Wyler, Allentown, Pa., to Trojan Powder Co., New York.

Patents—Textiles

Thickened textile printing agent, containing an aqueous colloidal solution of a carbohydrate, an oil, and a phosphatide of a homogeneous mixture. No. 1,986,360. Bruno Rewald, Hamburg, Germany, to Hanseatische Muhlenwerke Aktiengesellschaft, Hamburg, Germany.
Manufacture a wool substitute, which comprises crinkling loose unspun filaments of cellulose acetate by heating in steam under pressure. No. 1,986,945. Geo. L. Schwartz and Jas. H. Young, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Saturant for weatherproofing fabric; having a base of steam cracked residuum, air-blown asphaltic mixing stock, cut back with relatively light asphaltic residuum. No. 1,987,085. Robert B. Thurston, Beacon, N. Y., to The Texas Co., New York, N. Y.
Spinning solution for manufacture of soft-luster rayon; comprising viscose, cuprammonium, and an organic titanium compound. No. 1,987,095. Rudolph S. Bley, Elizabethton, Tenn., to North American Rayon Corp., New York, N. Y.

Patents—Tanning

Method tanning hides; immersing prepared hides in a liquid protective material. No. 1,988,684. Harold M. Gusdorf, Indianapolis, Ind.

Method tanning hides. No. 1,988,685. Harold M. Gusdorf, Indianapolis, Ind.

Manufacture tanning substances; heating a dioxy-diphenyl sulfone with formaldehyde and a sulfonic acid of a phenol in an alkaline solution. No. 1,988,985. Josef Schafer, Basel, Switzerland, to J. R. Geigy A. G., Basel, Switzerland.

Patents—Metals, Alloys, Ores

Production non-stainable steel alloy; using chromium, manganese, nickel, copper, silicon, molybdenum, carbon, and iron. No. 1,986,208. Frederick J. Maas, Chicago, Ill., fourteen per cent. to Alex J. Prominski, Chicago, Ill.

Production copper alloy for bearings; comprising: nickel, aluminum, molybdenum, iron, calcium, and copper. No. 1,986,209. Frederick J. Maas, Chicago, Ill., five per cent. to Albert W. Langkau, five per cent. to Adolph Kokoefer, and five per cent. to Edward Csar, all of Chicago, Ill.

Production copper alloy for conducting electricity; using silver, aluminum, silicon, titanium, molybdenum, iron, calcium, and copper. No. 1,986,210. Frederck J. Maas, Chicago, Ill., five per cent. to Albert W. Langkau, five per cent. to Adolph Kokoefer, and five per cent. to Edward Csar, all of Chicago, Ill.

Production non-stainable copper alloy; using nickel, manganese, silicon, molybdenum, iron, calcium, and copper. No. 1,986,211. Frederick J. Maas, Chicago, Ill., five per cent. to Albert W. Langkau, five per cent. to Adolph Kokoefer, and five per cent. to Edward Csar, all of Chicago, Ill.

Production a chromium-nickel-iron or steel alloy known as rustless iron or steel, by the reduction of the metal oxides of chromium and nickel by means of non-carbonaceous reducing agents. No. 1,986,702. Virginio Angelini, Milan, Italy.

Production steel, containing carbon, manganese, phosphorus, sulfur, iron, and usual traces of residual ingredients. No. 1,986,767. Wilbert F. Davis and Geo. E. Hitchens, McKeesport, Pa., to National Tube Co., New Jersey.

Ore separator. No. 1,986,778. Paul Hinkley, Los Angeles, Cal.

Concentrating an oxidized ore of an alkaline earth metal; using sulfate black liquor talloel during process. No. 1,986,816. Torsten Hasselstrom, New York, N. Y.

Preparation flotation agent for concentration of oxidized ores of the alkaline earth metals; comprising sulfate black liquor talloel, practically free of ligneous matters. No. 1,986,817. Torsten Hasselstrom, New York, N. Y.

Production aluminum base alloy, consisting of copper, manganese, silicon, bismuth, and aluminum. No. 1,986,826. Howard L. Hopkins, Cleveland, Ohio, to Aluminum Co. of America, Pittsburgh, Pa.

Production aluminum-copper alloy, containing copper, bismuth, and aluminum. No. 1,986,827. Howard L. Hopkins, Cleveland, Ohio, to Aluminum Company of America, Pittsburgh, Pa.

Production aluminum base alloy, consisting of copper, manganese, silicon, cadmium, and aluminum. No. 1,986,828. Wm. L. Fink, Oakmont, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Precious metal alloy composition; composed of gold, palladium, silver, copper, and indium. No. 1,987,451. Norris O. Taylor, Minneapolis, Minn., to Spyco Smelting and Refining Co., Minneapolis, Minn.

Precious metal alloy composition, composed of gold, palladium, silver, copper, indium, and platinum. No. 1,987,452. Norris O. Taylor, Minneapolis, Minn., to Spyco Smelting & Refining Co., Minneapolis, Minn.

Method applying coatings on metals, by passing wire through a small opening within a body of a chemical compound. No. 1,987,576. Kurt Moers, Charlottenburg, Germany, to General Electric Co., New York, N. Y.

Apparatus for thermic treatment of metal wires, filaments, bands, etc. No. 1,987,577. Kurt Moers, Berlin, Germany, to General Electric Co., New York, N. Y.

Method forming sheets of a copper-zinc alloy containing 63 to 68% copper. No. 1,987,628. Samuel McMullan, Downers Grove, and Elmore Steele Strang, Oak Park, Ill., to Western Electric Co., New York, N. Y.

Production brass alloy containing lead up to .5%; adding silicon up to 2% of the alloy to render the brass capable of being hot-rolled. No. 1,987,639. Robert T. Roberts, Riverside, Ill., to Western Electric Co., New York, N. Y.

Production high temperature thermostatic metal. No. 1,987,714. Howard Scott, Wilkinsburg, Pa., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Electro-deposition of tin; passing a plating current between a tin anode and a desired cathode in a solution of tin sulfate and sulfuric acid, then adding to solution a soluble cresol resin. No. 1,987,749. Paul R. Pine, Elyria, O., to Harshaw Chemical Co., Cleveland, O.

Method recovering values from spent zinc primary battery elements. No. 1,987,996. Elmer E. Dougherty, Glen Ridge, N. J., to Marlene Ruth Zimmerer, Bloomfield, N. J.

Manufacture solder for aluminum and its alloys; composed of tin, zinc, cadmium. No. 1,988,010. Edw. J. Kratz, Springdale, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Method coloring aluminum or aluminum alloy surfaces; using oxide coating treated successively with a solution of a reducible metallic salt and a reducing agent. No. 1,988,012. Ralph Bryant Mason, New Kensington, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Treatment oxidized ores free from sulfur to recover metal values. No. 1,988,015. Ralph F. Meyer, Freeport, Pa., to Meyer Mineral Separation Co., Pittsburgh, Pa.

Process producing an optimum state of hardness in metals. No. 1,988,040. Edw. Geisler Herbert, West Didsbury, Manchester, England.

Production an age-hardened alloy; consisting of nickel, copper, an age hardening element silicon, and retained calcium. No. 1,988,153. John Ward Bolton, Cincinnati, Ohio, to The Lunkenheimer Co., Cincinnati, Ohio.

Production alloy which is ductile and which may be softened and machined without hot rolling after being heat treated; composed of nickel, copper, and silicon. No. 1,988,154. John W. Bolton, Hamilton, and Sylvester A. Weigand, Cincinnati, O., to The Lunkenheimer Co., Cincinnati, Ohio.

Flotation apparatus. No. 1,988,351. Donald H. Fairchild, Salt Lake City, Utah, one-half to J. Patton Neeley, E. L. Patten, and Hugh B. Sprague.

Brazing alloy; filler for welding composed of an alloy of copper, phosphorus, and tin. No. 1,988,422. Wilber B. Miller, Flushing, N. Y., to Oxweld Acetylene Co., West Virginia.

Production a bearing alloy of copper, magnesium, and cadmium. No. 1,988,504. Wm. E. McCullough, Detroit, Mich., to Bohn Aluminum & Brass Corp., Detroit, Mich.

Process treating a sulfide ore predominating in iron to produce an iron concentrate low in copper and zinc. No. 1,988,523. Wm. S. Stringham, Mt. Pleasant, Tenn., to General Chemical Co., New York, N. Y.

Temperature-responsive compensator for magnetic measuring instruments; formed from alloy of nickel, carbon, manganese, and iron. No. 1,988,568. Donald W. Randolph and Ralph H. Mitchel, Flint, Mich., to General Motors Corp., Detroit, Mich.

Method recovering zinc from an uncompacted mixture of crude oxide and carboniferrous material. No. 1,988,608. William A. Ogg, Cincinnati, O.

Preparation aluminum products for chromium plating; etching surface in a solution of hydrofluoric acid, rinsing, and immersing in solution containing chromic acid. No. 1,988,645. Wm. H. Bowden, Newton, Iowa, to Maytag Co., Newton, Iowa.

Apparatus for ore separaton; including a bowl adapted for rotation relative to its radical axis. No. 1,988,794. Wm. Hill, San Francisco, Cal.

Manufacture chilled iron casting; comprising carbon, silicon, nickel, and chromium. No. 1,988,910. Paul D. Merica, New York, N. Y., James S. Vanick, Elizabeth, and Thos. H. Wickenden, Roselle, N. J., to International Nickel Co., New York, N. Y.

Manufacture a chilled iron casting, containing carbon, silicon, nickel, and chromium. No. 1,988,911. Paul D. Merica, New York, James S. Vanick, Elizabeth, N. J., and Thos. H. Wickenden, Roselle, N. J., to International Nickel Co., New York, N. Y.

Manufacture a cast iron alloy, containing carbon, nickel, and chromium. No. 1,988,912. Paul D. Merica, New York, N. Y., James S. Vanick, Elizabeth, and Thos. H. Wickenden, Roselle, N. J., to International Nickel Co., New York, N. Y.

Method recovering metals from ores or sands. No. 1,988,932. Craig Ritchie Arnold, Dahlonega, Ga.

Production copper alloy; consisting of copper, tin, and zinc; said alloy composition, when subjected to heat treatment, being capable of assuming a physical structure characterized by the presence of beta crytals distributed throughout a matrix of alpha crystals. No. 1,988,938. Michael George Corson, Jackson Heights, N. Y., three-twentieths to Geo. H. Corey, Bayside, N. Y.

Machine for concentrating ores and amalgamating gold ores. No. 1,988,500. Sydney Walter Lack, Waverley, near Sydney, N. S. W., Australia.

Patents—Miscellaneous

Process for a resinous condensation product derived from a polyhydric alcohol, a halogen-substituted aliphatic polycarboxylic acid, and a straight-chain unsaturated aliphatic monocarboxylic acid of the oleic acid series. No. 1,975,246. Frithjof Zwilgmeyer, Hamburg, N. Y., to National Aniline & Chemical Co., Inc., New York, N. Y.

Apparatus and process for vaporization. No. 1,975,222. Robert Vaughan Brown, Hamburg, N. Y., to National Aniline & Chemical Co., Inc., New York, N. Y.

Apparatus for treating ores. No. 1,989,972. Philip E. Billinghurst, Winnipeg, Man., Canada.

Production chlorinated hydroxydiphenyl; consisting of hydroxydiphenyl having at least one chlorine atom linked to carbon of the hydroxylated benzene nucleus. No. 1,989,081. Walter G. Christiansen, Bloomfield, N. J., and Eugene Moness, Far Rockaway, and Sidney E. Harris, Brooklyn, N. Y., to E. R. Squibb & Sons, New York, N. Y.

Preparation primary amines by catalytic reduction of oximes and nitriles. No. 1,989,093. Walter Henry Hartung, Balto., Md., to Sharp & Dohme, Inc., Phila., Pa.

Manufacture ammonium sulfate; catalyzing gas phase reaction between sulfur dioxide, ammonia, oxygen, and water by means of an oxygen transmitting nitrogen oxide. No. 1,989,124. Leon R. Westbrook, Cleveland Heights, O., to Grasselli Chemical Co., Cleveland, O.

Process for coloration of materials; comprising organic derivatives of cellulose by application of anthraquinone compounds. No. 1,989,133. Geo. Holland Ellis, Spondon, near Derby, England, to Celanese Corp. of America, Delaware.

Method decolorizing affinated sugar; by treating syrup made from the affinated sugar with hypochlorite No. 1,989,156. Pedro Sanchez, Buffalo, N. Y.

Manufacture waterproofing and polishing compound for wood; using a waterproof spar varnish, a heat bodied drying oil, a drier, a wax, and a thinner. No. 1,989,170. Harvey G. Kittredge, Dayton, O., to The Kay & Ess Chemical Co., Dayton, O.

The Literature

Articles of interest to the chemical and process industries particularly noted in a monthly review of the U. S. and foreign periodicals.

Alkalies. "The Alkali and Associated Industries—A Retrospect," by Dr. J. T. Conroy. A most instructive story about the international history and development of the alkali industry (mostly the manufacturing developments). Delivered before the Liverpool Section of the Society of Chemical Industry as the Hurter Memorial Lecture. *Chemistry & Industry*, British, Feb. 8, p21.

Chemical Specialties. "Paste Wax Floor Polishes," by P. H. Faucett. Author reviews what an ideal polish should be and then proceeds to show how close it is possible to come to this. *Drugs, Oils and Paints*, February, p64.

Hard Rubber. "Hard Rubber," by A. R. Kemp and F. S. Malm. A review of the known data on hard rubber with pertinent information on the vulcanization process and compounding practice. *Industrial & Engineering Chemistry*, February, p141.

Miscellaneous. "Chemicals in Commerce," by Williams Haynes. A detailed study and interpretation of the economics involved in the manufacture, marketing and use of industrial chemicals. *Journal of Chemical Education*, March, p103.

Plant Operation. "Softened Water in Mill and Boiler Services," in the *Rayon and Melliand Textile Monthly*, February, p32.

Raw Materials. "Chemical Lime Hydrate of Opportunity," by Sidney P. Armsby. *Chemical & Metallurgical Engineering*, February, p90.

Safety. "The Action of Chemical Agents on the Skin," by Rene Chesneau. Article describes the principal irritants, treatment and precautions. *The Dyer & Textile Printer*, British, Jan. 18, p70 and digested from the *French Journal*, *Revue Gen. des Mat. Col.*

Synthetic Chemicals. "Industry's Toolmaker," by Dr. G. O. Curme, Jr. The Perkin Medal Address. A recounting of the development of the synthetic chemicals made by Carbide & Carbon Chemicals. *Industrial & Engineering Chemistry*, February, p220.

Chemical Markets & News

Col. James J. Reilly and Elon H. Hooker Represent Chemical Industry in Washington, Protesting Against the "30-Hour Week Bill" and the "Economic Security Bill"—Allen, Lammot du Pont and Merck are M. C. A. Representatives in Coming Tercentenary Celebration—

Col. James J. Reilly, president of Barium Reduction, represented the chemical industry in Washington last month, protesting against the proposed so-called 30-hour week. Speaking in behalf of the M. C. A., Colonel Reilly clearly stated the reasons why the industry opposes. Said he:

"A survey of 598 establishments operated by 337 companies under the basic chemical code shows that 39% of all the factory units had 20 or less employees and that 64% had 50 or less employees. In fact, only 7 plants had over 1,000 men. Factories of my class have 20% of the employees.

"Peak demands and fluctuations in consumption require a reasonable leeway in hours of work. This is illustrated by an epidemic, such as influenza, which presents an immediate demand to increase the production of certain essential pharmaceutical chemicals. Insect infestations, such as the rapid spread of the boll-weevil or Mexican bean-beetle, likewise call for increased production of insecticides. Changes in style result in large demands for special colors and other products. Frequently the discovery of a new use is followed by a huge demand for a chemical, which can only be met by lengthened hours until new equipment is installed and new men properly trained for this manufacture. It is impossible to fully discount unexpected demands for products of the chemical industry, which is characterized by continuous change.

"It is not feasible to maintain a sufficient staff or a sufficient inventory for any emergency. Many operations of the chemical industry are continuous, and in a multitude of delicate chemical operations, such as finishing an obstinate nitroglycerin charge, it is essential that a single skilled operator complete a given operation."

Hooker Counsels Caution

The industry also called upon another prominent member to represent it in Washington last month, Elon H. Hooker, president of Hooker Electrochemical, appearing before the Senate Finance Committee as the official spokesman for the Manufacturing Chemists' Association and the Chemical Alliance in opposition to the proposed economic security bill. After giving an impressive resumé of the fundamentals involved Mr. Hooker told the inquiring Senators:

"In this country there is an appalling lack of information concerning the extent of unemployment and, in particular, concerning the nature and composition of unemployment during periods of normal business activity to which the bill before you is designed to apply. That being the case, it seems to me that we are trying to provide a remedy for a disease the nature of which is not known to us. It is not the intention of the people who framed this bill to take care of depressional unemployment. That is an impossible task for any unemployment insurance or compensation scheme. The burden of depressional unemployment must fall on society as a whole. My opposition to this bill rests, in the first place, on the ground that, to my knowledge, it has been prepared without an adequate factual study and without the necessary consultation with persons who will be most directly affected by its provisions. I should like to call to your attention the fact that before the first scheme of unemployment insurance was introduced in Great Britain, a Royal Commission spent 4 years studying the problem of social insurance and that before the new Unemployment Act was passed in 1934 another Royal Commission spent 2 years studying the question of necessary reforms in the existing scheme. Our Committee on Economic Security spent 6 months, in the atmosphere of a severe business depression most prejudicial to an impartial approach, studying the problem with which we are confronted. They had an impossible job, but this bill was sent to you unaccompanied even by a complete presentation of such facts as the Committee has been able to develop during the short period available to them for study and investigation.

"This bill should not be rushed through without a knowledge of the facts. We are creating an enormous bureaucracy to take care of a problem the magnitude and significance of which we really do not understand. We do not know whether or not as a result of this bill the problem of unemployment will be made less serious or more serious. I am convinced that if stable and regular employees, for whom industry is glad to assume its proper share of responsibility, are separated from the pool of unemployment existing in normal times, the problem can be handled by industry without building up a tremendous bureaucratic system the effect of which will inevitably be to increase unemployment and its costs."

Mr. Hooker listed his specific objections as follows:

1. It does not give expression to the ideas of the President of the United States that the individual States should have a large measure of freedom in experimenting with various schemes of unemployment compensation, according to their individual needs and circumstances.

COMING EVENTS

Annual Dinner, Drug, Chemical & Allied Sections, N. Y. Board of Trade, Waldorf-Astoria, N. Y. City, Mar. 21.

Electrochemical Society, New Orleans, Mar. 21-23.

Southern Textile Exposition, Greenville, S. C., Apr. 8-13. Also Greenville Section of the A. C. S.

A. C. S., 89th meeting, N. Y. City, Apr. 22-27.

Tanners' Council of America, Spring Meeting, Waldorf-Astoria, N. Y. City, May 1-2.

American Water Works Association, annual meeting, Netherland Plaza, Cincinnati, May 6-10.

Fifth Annual National Premium Exposition, Palmer House, Chicago, May 6-10.

American Institute of Chemical Engineers, spring meeting, Wilmington, Del., May 14-16.

Associated Cooperage Industries of America, Hotel Jefferson, St. Louis, May 14-16.

American Association of Cereal Chemists, Denver, June 4.

Canadian Chemical Association, Kingston, June 4-6.

American Electroplaters' Society, annual meeting, Bridgeport, Conn., June 10-14.

American Leather Chemists' Association, Annual Convention, Skytop Lodge, Skytop, Pa., June 12-14.

American Society for Testing Materials, annual meeting, Book-Cadillac, Detroit, June 24-28.

Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 2-7.

LOCAL TO NEW YORK*

Mar. 22. Joint meeting, Electrochemical Society in charge.

N. Y. Section, American Water Works Association, DeWitt Clinton, Albany, Mar. 21-22.

N. J. Sewage Works Association, Stacy Trent, Trenton, Mar. 21-22.

Secretaries of Chemical Associations and Groups allied to chemistry (also the process industries) are urged to make use of this column.

*** Chemist Club unless otherwise stated.**

The bill, as framed at present, practically forces the States to adopt a State-pooled fund. It forces them, furthermore, to apply a 3-percent. payroll tax to all non-manual employes regardless of the amount of annual income. If the States are to comply with the provisions of this bill, they cannot experiment with other types of unemployment compensation, such as individual reserve plans.

2. The financial burden on the States would be uneven, because the risk of unemployment varies greatly from State to State. As a result, with a 3-percent. payroll tax certain States will be able to pay higher benefits than other States. The effect of this would be migration of labor from one State to another to take advantage of higher benefits. The only way to avoid this migration would be for some States to impose a tax of more than 3 per cent. This, however, would place industries in those States in a disadvantageous competitive position.

3. Government employes should bear their share of the cost.

4. Elimination of firms employing less than 4 employes is discriminatory.

5. The bill covers only about 50% of the gainfully employed or about 25,000,000 out of 49,000,000 gainful workers. If the bill had been in effect during the depression, it would have covered in '33 only about 16,000,000 workers, according to the Committee on Economic Security, that is, about 9,000,000 would have dropped out of the scheme and become a direct charge on the State.

6. If this bill had been in effect in '29, the income from a 3% payroll tax under the provisions of this bill would have amounted to over $1,000,000,000. In '32 the income would have declined to about $560,000,000. When the need is greatest, income is smallest and insignificant compared to needs.

7. The proportion of workers covered would vary from State to State. In some agricultural States only one-fourth of their workers would derive benefits under the plan, while in the highly industrial States as much as three-fourths of the workers would be covered. This situation would be inequitable.

Further Study Necessary

Mr. Hooker concluded with the following remarks:

"I think that we need more time and more factual information to understand the implications of the plan here proposed. The bill which you are considering would not help the unemployed and it would not be of much value to the workers who are now employed. Contributions for old age pensions would not begin until January, '37. There is no need, therefore, for rushing the bill through in such a hurry. As a matter of fact, I am convinced that the people whom it is intended to help would be greatly benefited by a more intensive study of the scheme here proposed and all its implications. In particular I should like to urge you not to impose special burdens on industry at the moment when it is trying to pull itself out of the worst depression in its history. Any measure which raises costs is detrimental to recovery. The bill you have before you now will eventually place a burden on business equivalent to over 17% of the payrolls affected.

"My proposal to you, therefore, is to appoint 2 joint congressional committees, one to make a comprehensive study of the question of unemployment insurance or compensation and the other to investigate fully the problems of old age dependency and the best measures for its relief. In the meantime emergency measures should be devised to take care of the unemployed and the aged who find themselves without adequate means of support.

"From my point of view, we have an immediate emergency which we must meet with emergency taxation and emergency payments to the unemployed and should pay for it within our own generation. After we have done so and taxed ourselves for it, then is the time for us to consider whether we can afford to do these wholly desirable but extraordinarily expensive things and pay for them ourselves."

Associations

¶Chemical Industrialists are Actively Cooperating in Plans for April A.C.S. Meeting—A.C.S. Section Notes—Resin Manufacturers Elect—Notes on Other Groups—

The M. C. A. appoints E. M. Allen, President, Mathieson Alkali; Lammot du Pont, president, du Pont Co.; and George W. Merck, president, Merck & Co., as a committee to co-operate with the A. C. S. in celebrating in New York during the week of Apr. 22 the 300th anniversary of the founding of the chemical industries in America.

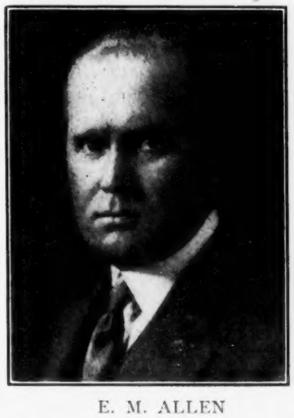
Sen. Pat Harrison (Miss.) and Rep. James W. Wadsworth (N. Y.) will be among the speakers at a dinner meeting on Wednesday evening, Apr. 24. On the same day a chemical industries symposium, planned to interpret the close relationship between the chemical industries and the national welfare, will be held. Thomas Midgley, vice-president of Ethyl Gasoline, will deliver an address on "Chemical Developments in the Next One Hundred Years." William B. Bell, president, American Cyanamid, will speak on National Planning and the Chemical Industries.

Other themes at this symposium include: "What the American Chemical Industries Have Done and Are Doing for the Nation"; "New Foreign Problems Confronting the American Chemical Industries"; "Scientific Foundations of the American Chemical Industries."

On Thursday, Apr. 25, there will be a symposium on the economic problems of the chemical industry, with R. P. Soule, chemical economist of the Tri-Continental Corp., as chairman. "Machine Age or Material Age?" is one of the topics to be discussed.

"New materials rather than new machines are characteristic of the present era," the announcement points out. "The rise of the process industries in the post-war decade will be described, the discussion centering around synthetic fuels, building materials, rubber wrappings; the encroachment upon agriculture and the products of the farm; the realignment of industries; and the outlook for the future."

Depreciation and obsolescence charges under the New Deal will be another theme of this symposium. The chemical industry is outstanding in high charges for depreciation and obsolescence. The chemists will discuss federal policy toward reducing corporate surpluses and increasing tax revenues, and will explain their attitude toward current and past depreciation and obsolescence reserves.



E. M. ALLEN

LAMMOT DU PONT

GEORGE W. MERCK

Members of the M. C. A. Committee. Industrialists and scientists are joining hands to celebrate the 300th anniversary of the founding of a chemical industry in America

The question of chemical prices will also come up, the discussion involving the trend of typical prices against the background of the general price structure, below both 1914 and 1926 levels. A protective tariff, according to the announcement, has not increased prices, low prices resulting in spite of high wages. Other problems to be dealt with include prices vs. earnings, trend of prices in the future, elastic and inelastic markets for chemicals.

A 3rd symposium will be devoted to materials of construction in the building industry. The chairman will be Prof. James R. Withrow of Ohio State. A group of papers will outline the latest developments in new materials of construction important to the chemical industries. These papers will cover a wide range of materials, including metals, ceramics, plastics, rubber, and alloys.

Sessions are scheduled by the Society's nineteen professional divisions. On Tuesday evening, Apr. 23, the William H. Nichols Medal of the N. Y. Section will be bestowed upon Father Julius A. Nieuwland of Notre Dame.

Numerous allied organizations, industrial and scientific, are aiding in the plans for the tercentenary events. Among them are the Synthetic Organic Chemical Manufacturers Association, and the chemical societies of the metropolitan district.

With the Sections

We use twice as much petroleum as drinking water, Dr. Merrill R. Fenske, director of the petroleum refining laboratory of "Penn State," tells N. Y. Section members of the A. C. S. Speaker gave no figures on alcohol consumption. Dean Frank C. Whitemore of the Penn State School of Chemistry & Physics, chairman of the meeting, asserts petroleum is "the basis of a multi-billion dollar industry covering a good portion of the globe."

Prof. Harold Hibbert, first chemist to indicate the chemical structure of cellulose, is the February speaker of the Midland group. An Englishman, educated in Manchester and Leipzig, at one time a du Pont chemist, later at Mellon, professor of chemistry at Yale until '19 and since then at McGill, made "news" last year when he grew "starchless potatoes."

"Permutations and Combinations"

"Permutations and combinations," a complex mathematical formula, permitted Dr. W. S. Calcott, du Pont dye laboratory director, to estimate that dyes for 50,000,000 colors could be made; that it would take one chemist 167,500 years and $25,000,000 to find the 50,000,000 color combinations; or if time becomes an important element, he figures 4,187 chemists devoting their entire lives could do the job but the cost would still be $25,000,000. Dr. Calcott stuns Chicago Section with the statement that it took but 30 minutes to calculate the possible number of colors.

Other February Speakers

Guest speaker of the Nebraska Section, Dr. M. J. Blish, talks on "Problems in Experiments in Protein Chemistry."

Roger Adams, president-elect of the A. C. S., speaks before the Virginia-Blue Ridge Division on "Modern Trends in Chemistry."

Niagara Falls A. C. S. chemists hear T. A. Boyd, head of G. M.'s fuel section, lecture on "Chemical and Physical Researches on Engine Combustion."

Prof. George L. Clark's subject before the Philadelphia Section at the February meeting was "From Metals to Living Nerves." Dr. Clark is at Illinois.

Dr. E. W. Reid of Mellon is the February speaker before the Wichita Section.

Willis Gibbons, director of development of the general laboratories of U. S. Rubber, talks on "Some Industrial Applications of Rubber Latex," before the North Jersey Section on Feb. 11.

Phila. Club Expands

Dr. Ivor Griffith, well-known scientist, was the principal speaker at the Mar. 5 meeting of the Chemical Club of Philadelphia. Drive for new members results in 17 new members in February. Booster Prize for the last meeting was contributed by C. F. Wolters of Consumers Chemical.

Product Protection

"How To Protect Your Product from Counterfeiters and Imitators," is the subject chosen by Speaker Daniel L. Morris at the monthly luncheon of the Drug, Chemical and Allied Trades Section, N. Y. Board of Trade, on Feb. 26 at the Hotel McAlpin.

Brown Heads Resin Makers

Synthetic Resin Manufacturers' Association elects Bakelite's Gordon Brown as president; A. J. Wittenberg, vice-president of Paramet Chemical, as vice-president, H. C. Gerlach of John D. Lewis, as secretary-treasurer. R. M. Banks, Cyanamid, and C. K. Mead, G. E. Supply, are directors.

Smith, Howe Lecturer

Earl C. Smith, chief metallurgist of Republic Steel, delivers the '35 Howe Memorial Lecture before the American Institute of Mining & Metallurgical Engineers on Feb. 20. His subject: "Some Studies of Problems in Steel Making." Howe Memorial Lecture is given annually under the sponsorship of the A.I.M.M.E. as a tribute to the late Dr. Henry Marion Howe of Columbia, dean of metallurgy teachers.

"Globe Trotter" Edwin C. Hill comments in "The Human Side of the News"—

"Big banks are getting chemists on their boards of directors. Great industrial chemical firms, like the du Ponts, are fashioning a new inner scientific matrix in our society."

Foreign

¶I. G. Expands Plant Facilities—British Chemical Industry Shares in Business Revival—Montecatini Adopts 40-Hour Week—China's Chemical Industry—

Notwithstanding a considerable reduction in export trade the I. G. continued to expend large sums for modernization of existing equipment and the erection of new plants during '34.

This action on the part of the Dye Trust, is in line with the Government's policy to make Germany as self-sufficient as possible by producing synthetically materials which must now be imported, and which at present can not be obtained in sufficient quantities owing to the shortage of exchange.

In '34, the German Dye Trust expended 120,000,000 marks for new construction and 130,000,000 marks for general repairs and improvement. This compared with 40,000,000 and 83,000,000 marks, respectively, in '33, according to the report.

Importance of the I. G. in Germany's chemical industry may be gauged from the fact that of all persons employed by the country's chemical industry, approximately 25% are on the Dye Trust's payrolls. Of the directly owned capital invested in the industry it controls 33⅓% and of the total in plants and equipment it controls 40%. The Trust is credited with producing one-third of Germany's total chemical output and accounts for two-thirds of the country's total export trade in chemicals.

The number of wage earners in the Dye Trust's chemical plants was increased 27,535 during '34, and 4,844 new employees were added to payrolls of the Trust's subsidiary mining enterprises. It appeared at the end of the year that the number of persons employed by the Trust was only slightly less than at the end of '28, when a peak of 154,596 was reached.

Foreign Trade Was Slow

British chemical industry shared in the general revival of domestic business in England during '34 but as with most other branches of industrial activity foreign trade in chemical products did not expand to the same extent. There was only a moderate increase in chemical exports with a somewhat larger increase in imports compared with '33.

Expansion in domestic business was due largely to marked expansion in all key chemical consuming industries except the cotton and woolen and worsted groups. Rayon production established a new record, building and construction was active, and Government measures to aid agriculturists resulted in a steady domes-

tic demand for fertilizers. Prices of chemical products were generally steady throughout the year.

Persons employed in the chemical industry between the ages of 16 and 64 who were registered under the Unemployment Insurance, numbered 94,079 in June, 1934, compared with 87,001 in June, 1933, or an increase of 8%. This compares with an increase of 5% in the number employed in all England's industries during this period.

New developments in the British chemical industry in '34 included progress in the development of motor spirits from coal, the development of a new plastic product, which is said to be particularly easy to turn and carve, and a new process for producing a solvent and thinner for paint and varnishes.

Chemicals and allied products imported into England during 1934 were valued at £21,168,200, an increase of 23% over '33, while exports of such products increased 7% to £23,446,000.

British—U. S. Trade

Complete statistics of England's trade in chemicals and allied products with the U. S. during '34 are not yet available but a preliminary survey indicates that imports of such materials increased 14% and exports to the U. S. almost doubled.

In view of continued economic improvement in Great Britain, as well as in many markets to which that country exports, it is likely that the British demand for American chemical products will continue to show improvement during the current year, C. C. Concannon, Chief of the Commerce Department's Chemical Division discloses. The U. S., he points out, is one of the principal sources of many chemical products required in British industry, particularly naval stores, sulfur, carbon black, phosphate rock fertilizer, chemical specialties, and medicinals.

Montecatini's 40-Hour Week

Montecatini has decided to adopt the 40-hour week at its mines. This will allow the company to take on 871 workpeople, which will bring the effective personnel of the mines to 3,500.—It is reported that the company's profits for '34 have exceeded those of '33 by 20%. A dividend of 8% will again be declared, although the capital has been increased from 500 to 600 million lire by the distribution of one free share for every 5 shares held.

China Builds An Industry

China is rapidly building up a chemical manufacturing industry. The Government is actively aiding, with the idea in mind that the national defense requires erection of certain types of chemical plants. A liquid ammonia and nitric acid plant is now under construction in Shanghai and is expected to be in production by July 1. In the same city an alcohol plant was erected in '34 under the joint auspices of the Government and private capital. Original plans for daily output of 6,000 gals. from this plant were later increased to 7,500. Negotiations are now under way for the construction of other alcohol plants at Changsha and Canton.

A modern plant for the production of oxygen and acetylene went into production at the end of '34 and sulfuric acid plants were established in Honan province, Central China. Other plants established during the past 2 years are now under construction include those for the production of caustic, bleaching powder, anhydrous ammonia, ammonium sulfate, sulfur black, and other miscellaneous chemicals.

Foreign Notes

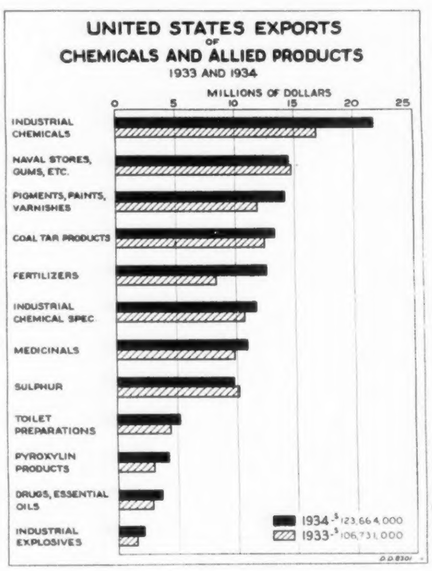
Palestine Potash, Ltd., is making an issue of 350,000 5½% cumulative redeemable participating preference shares of £1 at 20s. 6d. per share in Palestine.

Russian production of magnesium is to commence at a plant in the Urals.

Foreign Trade

¶U. S. Imports Rose in '34 — Territorial Chemical Markets— U. S. Trade With Cuba—Swiss Dye Production and Shipments—

U. S. chemical imports rose 11% in '34 over the previous year's total to the substantial total of $96,000,000. While many items registered quantity gains, most, if not all, of the gain in value was probably due to lower dollar exchange.



Our exports increased last year too, in all but two items, naval stores and sulfur

Fertilizers imported were valued at $26,029,250, an increase of 6% compared with '33, while the quantity increased 2% to 1,247,259 tons. Notable developments occurred in the fertilizer import trade in '34. Ammonium sulfate imports decreased substantially from the record peak of '33 while receipts of sodium nitrate increased. Cyanamid imports have gained for each of the past 3 years. Guano imports declined sharply owing to shortage of supply in Peru, leading world exporter of this material. Potash imports totalled 379,973 tons—a decline of only 1,264 compared with '33.

Industrial chemicals ranked next to fertilizers in importance and were valued at $17,469,000, an increase of 2% compared with '33. Imports of coal tar products were next and were valued at $11,847,058, an increase of 23½%, according to Dept. of Commerce statistics. Of this total, imports for consumption of colors, dyes, stains, etc. accounted for $5,456,309 in '34 compared with $5,675,681 for the preceding year.

Imports of gums, resins and balsams totaled $7,675,140, an increase of 30% over '33. This group consists chiefly of shellac, and other gums and resins, used as raw material in the American paint and varnish manufacturing industry.

Imports of tung oil were valued at $6,838,247, compared with $4,833,356 in '33 notwithstanding a decline in quantity from 118,760,000 lbs. to 109,787,000.

Other increases: medicinals and pharmaceuticals, 18½%; explosives, 120%; cod liver oil, 66%; beeswax, 11%; tankage and fish scrap, 5%; and soaps and toilet preparations, 32%.

Large increase recorded in imports of explosives was due to heavier receipts of firecrackers, item which makes up the bulk of "explosives" imports.

Chemical commodities registering declines in values in '34 included pigments, paints and varnishes, 16%; matches, 21½%; inedible gelatin, 70%; glue and glue size, 53%; casein, 69%; bones, hoofs, and horns, 14%; and linseed oil, 70%.

Our Territorial Markets

Hawaii, Puerto Rico, and Alaska are important market areas for chemicals and allied products manufactured in continental U. S., particularly articles of the better grades. Together the three purchased $9,601,000 worth of such products in '34, a 7% increase over the preceding year when such purchases were valued at $8,988,000.

Purchases by Hawaii, largest customer of the 3, totalled $4,579,000 in '34, an increase of 2% over '33; Puerto Rico's purchases were valued at $3,984,700, an increase of 7%; and Alaska's purchases advanced 31% to $1,037,000.

Hawaii and Puerto Rico purchase large quantities of fertilizers, particularly nitrogen, phosphates and potash for use on their extensive pineapple and sugar cane plantations. Fertilizer purchases by the former amounted to $1,725,800 and the latter $1,397,660 in 1934, statistics show.

Industrial Chemicals and Specialties

Industrial chemicals and chemical specialty purchases valued at $1,382,000 followed in importance, with Hawaii taking $746,550 worth and Puerto Rico $446,000. Other important purchases included paints, varnishes and pigments, $1,184,600; explosives, $588,000; matches, $268,875; naval stores, linseed oil, crude drugs, coal tar products, and pyroxylin products. Alaska purchased $354,300 worth of explosives in '34 compared with $270,800 during the preceding year, reflecting increased mining activity during the year.

U. S. Gains Cuban Markets

Exports of chemicals and allied products from the U. S. to Cuba recorded a substantial gain in '34 over the preceding year. This increased trade was particularly evident in the fertilizers, medicinals, paints, varnishes and rosin.

Swiss Dye Statistics

While Swiss dye production was well maintained during '34 and exports increased slightly over '33, the hoped-for revival of business did not materialize, according to a report from Consul Alfred W. Donegan, Basel, made public by the Commerce Dept.'s Chemical Division. Sales during the first 4 months of '34 were heavier than for the corresponding period of '33 but declined during the summer and fall months. Official statistics show that exports, which account for 95% of the Swiss production, were slightly larger than for '33, but this was due largely to special shipments, in excess of regular requirements, exported to countries where import restrictions were anticipated.

Shipments to the U. S. were smaller but Canada and South American countries increased purchasers. In the Far East where sales of Swiss dyes have been declining steadily for years, there was no improvement.

U. S. Swiss Dye Purchases

The U. S. is a leading purchaser of Swiss dyes taking 11.6% of all dyes exported from that country in '33, with only Germany taking a larger amount. U. S. imports of Swiss coal tar dyes in 1934 totalled 1,593,000 lbs. or 47% of the imports from all countries, compared with 1,742,700 lbs., or 44% of imports from all sources in the preceding year.

RFC Chemical Loans

Chemical industry has shown little interest in RFC loans. Of a total of 599 industrial loans ($34,222,535) made between June 19 and Dec. 31, '34, chemical and allied industries provided 16 borrowers or 2.7% of the total authorized; amounts borrowed reached $696,000 (2% of the total). Lumber industry was the heaviest borrower; rubber the lightest.

Trade Commission

¶Carbon Black Export, Inc., Formed Under Webb-Pomerene Export Trade Act—

Carbon Black Export, Inc., files papers under the Export Trade Act (Webb-Pomerene law) with the Federal Trade Commission, for exporting carbon black. Association will maintain offices at 500 5th ave., N. Y. City. Officers of the association are: C. E. Kayser, president and director; Reid L. Carr, secretary and director; F. R. Cantzlaar, treasurer; E. V. Gent, assistant treasurer; Godfrey L. Cabot, Thomas D. Cabot, F. F. Curtze, Oscar Nelson, D. P. Hynes, G. A. Williams, R. H. Eagles, Hans Huber, T. J. Butler and Robert Wishnick, directors.

Members are: United Carbon Co., Charleston, W. Va.; Columbian Carbon Co., N. Y. City; J. M. Huber Corp., N. Y. City; Century Carbon Co., N. Y. City; Panhandle Carbon Co., N. Y. City; Godfrey L. Cabot, Inc., Boston; Texas Carbon Industries, Inc., Sayre, Okla.; and The Palmer Carbon Co., Chicago.

The Export Trade Act grants exemption from the anti-trust laws to an association entered into and solely engaged in export trade, with the provision that there be no restraint of trade within the U. S., or restraint of the export trade of any domestic competitor, and with the further prohibition of any agreement, understanding, conspiracy or act which shall enhance or depress prices or substantially lessen competition within the U. S. or otherwise restrain trade therein.

Obituaries

¶Pacific Coast Chemical Section Loses 2 Outstanding Leaders, Braun and Hill—Peep, Rohm & Haas, Stricken in N. Y. City—

Frederick W. Braun, 76, pioneer veteran chemical distributor and manufacturer and Los Angeles civic leader, on Feb. 9, following a heart attack. Fifty years ago he founded the first wholesale drug company west of the Mississippi; later started the F. W. Braun Corp. A branch, known as Braun, Knecht, Heineman, operates in San Francisco.

M. C. Hill, 32, member of the firm of Hill Bros. Chemical Co., Los Angeles, on Feb. 19, of an infection following a tonsilectomy. In '24 he and his brother, C. Beverly Hill, started the present business.

Peep, Insecticide Authority

Dr. Charles H. Peep, 42, director of Rohm & Haas' laboratories and an outstanding authority on insecticides and disinfectants, suddenly on Feb. 27, following a cerebral hemorrhage. He was in N. Y. City attending a meeting of the National Association of Insecticide & Disinfectant Manufacturers when stricken.

Other Deaths Last Month

Robert Andrews, president, Andrews Lead, Long Island City, on Jan. 31, following a short illness.

Philip O. Harding, 53, in the Hercules Powder engineering department for a number of years, on Feb. 1, following an operation.

Walter Perry Mullen, 47, V.-C.'s Birmingham manager, on Feb. 2.

George W. Miller, 55, founder and president of the synthetic resin firm of Miller Gum Co., Chicago, on Jan. 31.

Ray C. Allen, 46, Harshaw Chemical sales representative, on Feb. 16 in an automobile accident.

Metals

¶London Tin Market Crashes—Investigation Opposed by British Government—

Price of tin has declined sharply (47.35c on Feb. 28, as against 51.10c on Jan 31) as a result of the crash in the last month of the huge British commodity pool, more complete details of which are given in the account of the shellac markets, page 265. With one metal cartel after the other failing, the tin restriction plan has functioned smoothly for several years and was credited with bringing about a substantial price rise. But with the bottom dropping out of the London commodity markets generally and with the pool releasing (according to reports) several thousands tons of metal the market in the past 4 weeks has sagged badly. All sorts of unconfirmed rumors are heard concerning the buffer pool of 8,000 tons.

Under a bombardment of questions in the House of Commons on Feb. 10, the Government flatly refused to order an investigation of the position in tin or other commodities at present.

Sir Philip Cunliffe-Lister, Secretary for the Colonies, who was a director of Consolidated Tin Smelters until '31, expressed complete satisfaction with the tin-restriction scheme, with which his department of the government is now so closely concerned. He said he had received no "representations" against alleged attempts to create a monopoly in tin, and added:

"The area of production of tin is so wide that it is almost inconceivable that it should come under a single control."

A widespread belief in the market is that a private pool now holds about 5,000 tons of tin, although any such estimate is only a guess. This and the buffer pool, which is supposed to amount to 8,000 tons, represent about £3,000,000 worth of the metal at present high prices.

Washington

Court of Customs and Appeals Issues a Far-Reaching Decision—U. S.-Brazilian Trade Agreement—Stearic Acid Producers Protest Proposed Netherlands Pact—NRA Extends Emergency Period for Agricultural Insecticide and Fungicide Industry—

A decision of great significance was handed down Feb. 25 by the U. S. Court of Customs and Patent Appeals when it reversed the findings of the Tariff Commission holding that importation and sale in this country of apatite from Russia constituted acts of unfair competition in violation of Section 337 of the 1930 Tariff Act.

By a 5 to 4 vote it ruled that patents held on the "process" of manufacturing the product in this country but not in Russia could not be used to prevent the importation and sale of the material in the U. S., although the same process of manufacture might have been used in Russia.

Ruling was handed down in a suit brought against Amtorg Trading by 3 domestic concerns licensed to manufacture and sell the product by holders of processing patents. See CHEMICAL INDUSTRIES, Feb. '33, p153.

Making a clear distinction between patents on the manufactured article and patents on the manufacturing process, the Court held "a process patent is not infringed by the sale of a product made by the process, the product itself not being patented, and a product patent is not infringed by one who uses the process by which it is made, the process itself not being patented."

Decision is believed to contain a new construction of the purposes and effect of Section 337 of the 1930 Tariff Act and is considered of the highest importance to those seeking relief under this section on the grounds of unfair competition for alleged infringement of patent rights.

In arriving at its conclusions, the Court recognized that the construction now placed on the meaning of Section 337 differs from that in other cases upon which it has rendered opinions involving patent infringements and cited 3 instances wherein corrections must be made in its previous decisions.

Effect on Northern Pigment Case

These cases are Northern Pigment Co., involving both process and product patents (see CHEMICAL INDUSTRIES, '33, pages 350, 540, April and June respectively), and Frischer & Co., and Orion Co., the latter 2 involving only patent products. Court stated that in the Northern Pigment case its decision went further than the statute provides and that, in so far as it involved process claims, it was erroneous. In the Frischer and Orion cases, the Court withdrew any expressions of adjudication relating to process patents.

It further stated in regard to the 2 latter cases that "nothing herein contained should be construed as revoking or modifying, in any respect, the decisions rendered with reference to product patents." No such statement was made with reference to Northern Pigment Co. and it was believed this leaves the door open for further proceedings in this case.

No Russian Patent

Returning to the present case, the Court said that the use of the process in Russia for the manufacture of apatite was entirely legitimate, since the patentees held no Russian patents.

"Were the situation reversed, that is to say, if patentees held Russian patents but not U. S. patents for the process only" the Court held "such patentees would have no exclusive right to use same in the U. S. which could be protected by the courts under the laws of the U. S.

"In the case at bar, the apatite (the article) is not patented. Hence there is no infringement of the patented process by a sale of apatite. The Russian exporter had a perfect right to sell and the American importer had a perfect right to buy the apatite and to resell it in the U. S., in so far as any question of a product patent is concerned. Had there been a product patent we should, of course, have here a case analogous to the material parts of the Frischer and Orion cases."

Chemicals in Brazilian Pact

Trade agreement between the U. S. and Brazil, signed at Washington on Feb. 2, provides for reductions in existing duties of each country on certain products of which the other has been an important supplier, and assurances against imposition or increase of duties on certain other products. In addition, it contains reciprocal assurance of unconditional most-favored-nation treatment of each other's commerce in all respects, and special safeguards against the impairment of the trade benefits of this agreement through import quotas, new internal taxes, or exchange control. No date has yet been set for bringing this agreement into operation. It is subject to the approval of the Brazilian Congress, and will come into force 30 days after the ratification by the Government of Brazil and the approval of the President of the U. S. have been exchanged.

U. S. CHEMICAL AND ALLIED PRODUCTS EXPORTS AFFECTED BY TREATY

	Old rate (Milreis per legal kilo)	New rate (Milreis per legal kilo)	Per cent. Reduction
Turpentine	1.040	0.780	25
Ready-mixed paints	1.560	1.170	25
Enamels	3.120	2.600	16⅔
Under coating for lacquers	3.120	2,340	25
Nitrocellulose lacquers	5.200	2.400	53.8
Varnishes	7.800	5.200	33⅓

U. S. IMPORTS OF CHEMICALS AND ALLIED PRODUCTS AFFECTED BY THE TREATY

	Present Rate of duty (Per cent.)	New Rate of duty (Per cent.)	Per cent. Reduction (Per cent.)
Copaiba balsam, natural and uncompounded (ad valorem)	10	5	50
Ipecac, not advanced in value	Free	Free	Bound**
Ipecac, advanced in duty (ad valorem)	10	5	50
Carnauba wax	Free	Free	Bound**
Beeswax	Free	Free	Bound

* Gross kilos.
** Brazil agrees (is bound) not to apply duties during life of agreement.

Ruinous Stearic Competition

Stearic acid industry protests any reciprocal agreement with the Netherlands allowing lower tariff on acid imports. George H. Rasch, appearing before the Committee for Reciprocity Information on Feb. 4, stated acid is being sent from the Netherlands here at prices below those established among European manufacturers which were formerly large buyers of American red oil.

Hull Replies on Manganese

Secretary of State Hull strikes back at critics of the manganese ore tariff concession contained in Brazilian reciprocal trade agreement, with plea that less than 10% of domestic requirements are met with domestic ore; that reduction in duty from 110% to 55% cannot hurt employment, for only a relatively few hundred are engaged in the domestic industry. He bitterly assails U. S. producers, alleging number of broken promises.

Egg Yolk Process Tax?

Members of the Dried Egg Product Association of America attended a meeting in N. Y. City held last month for the purpose of discussing a proposed bill by Congressman Lea (Calif.), which calls for a 31c excise tax on dried egg products. Tax will apply only to imported egg products.

Should such a bill be passed, the importation of dried egg products into the U. S. would be totally prohibited, it is said. These are products widely used in tanning and dressing leather, and in the baking, confectionery and ice cream trades.

A committee headed by A. E. Neumer of Bridges, Neumer & Co. has been appointed to oppose this legislation. Other members are S. K. Adams, R. Kaiser of T. M. Duche & Sons. James Tasley,

Consumers Importing Co., and F. Randolph Melchers, Inc.

The "Blue Eagle" Last Month

NRA extends emergency period in the agricultural insecticide and fungicide industry under which the minimum selling price for lead and calcium arsenates was established for another 90 day period (until May 8, '35). With the approach of the peak season, fear was expressed that if the emergency was allowed to expire the industry would revert to its former chaotic condition.

An amendment prohibiting "destructive pricing" has been proposed by the Code Authority for the agricultural insecticide and fungicide industry—a division of the chemical manufacturing industry. Term "destructive pricing" is defined under the proposal to mean the sale or offer for sale of products "without profit or below cost," or at prices which "imperil small enterprises, or tend towards monopoly or impair code wages and working conditions."

Code at present permits the establishment of lowest reasonable costs below which members would not be permitted to sell products in the event an emergency is declared by the Code Authority and approved by NRA. Such an emergency, under which the minimum selling price for lead arsenate and calcium arsenate was established, has been declared and approved by NRA but is due to expire on Apr. 7.

Suggestions or objections concerning the proposed amendment may be submitted to Deputy Administrator Ovid E. Roberts, Jr., Room 4057, Department of Commerce Bldg., Washington, before Mar. 22.

Code Budgets

Linseed oil code authority asks approval of a $20,000 budget.

NRA approves a $20,000 budget for the sulfonated oil industry.

Specialty Code Authority

NRA approves Robert M. Bowes, Bowes Seal Fast Corp., Indianapolis, and W. F. Veech, Kant-Rust Products, Rahway, N. J., as non-association members of the code authority for the automotive chemical specialties industry.

"The Last Round-Up"

Since the official close of the CHEMICAL INDUSTRIES' poll on the NRA (reported in detail in the February issue, p145) 36 additional returns have been received. Of this total 16 are in favor of abolishing the NRA, 16 are for a modification of the NRA, and only 4 are for a continuation of the NRA as at present constituted. In the final figures as reported in last month's issue, 49.8% favored abolition, 38.4% favored a modification, and 11.7% voted for continuance. The trend in the voting in the latest ballots to be received follows that noted in the returns officially reported in the February issue, for if the 36 votes are incorporated in the first total, the percentages read, for abolishing, 49.6%, a loss of .2 of a per cent.; for modification, 38.7%, a gain of .3 of a per cent.; for continuance, 11.6%, a loss of .1 per cent.

Litigation

¶Milwaukee Sewage Commission Suffers Set-Back—Southern Phosphate Charges Infringement

An order granting Activated Sludge, Inc., free access to all books, records and contracts of the Milwaukee Sewerage Commission, pending final settlement of the suit brought by Activated Sludge against the Commission for infringement of patents in the manufacture of Milorganite fertilizer, is given on Feb. 16 at Milwaukee by Federal Judge F. A. Geiger.

Order includes all contracts relating to the construction of the sewage disposal plant and orders and sales records and receipts for the manufacture of the fertilizer.

Judge Geiger had previously ruled that the Sewerage Commission, pending final disposition of the suit, turn over to Activated Sludge, Inc., through the federal clerk of courts, all profits from the manufacture of "Milorganite."

Southern Phosphate, Baltimore, charges infringement of patent on process of concentrating oxidized ores and minerals, in suit entered in Wilmington Federal Court on Feb. 5 against Phosphate Recovery of N. Y. City. An accounting and preliminary accounting are asked.

Personal

¶Kraus, Gibbs Medalist—Mac Naughton Makes a Copper Mine Pay—Wasserscheid Heads Drug and Chemical Club—Lammot du Pont on the Air March 14—

A picturesque figure, with gray goatee, stepped off a train at Denver on Feb. 2, peered intently through thick eye glasses, looking for a welcoming committee from the local A. C. S. Section, when a telegraph boy stepped up and inquired:

"Are you Dr. Charles A. Kraus?"

"Yes, son, I am," the kindly looking gentleman replied.

Opening the proffered telegram he read, "You are awarded '35 Willard Gibbs Medal, Chicago A. C. S. Section."

Telling no one, the internationally known professor of chemistry of Brown University addressed the Brown Club of Denver at luncheon, and the local A. C. S. Section in the evening, and then boarded a 10 o'clock train for his Providence home. To the Brown alumnae he said, "I would dislike having on my conscience the thought of having aided in the science of mass murder. You hear many conjectures about how horrible the next war will be, how chemistry will mete out quick death to entire nations. I believe these matters are out of the hands of the scientist. I am more interested in the chemistry of peace than the chemistry of war."

On Feb. 11 formal announcement of the award came from the Society's N. Y. City headquarters, the selection, it was stated, having been based in part on Dr. Kraus' contributions to the knowledge of reactions in liquid ammonia.

Announcement states that Dr. Kraus' work on conductivity of hydrogen chloride in water "is today regarded as classical." That he has contributed to the knowledge of the conductivity of solid metallic compounds, alloys and glass, and also is credited with much of the research leading to the discovery of "pyrex" glass.

After the discovery was made that tetraethyl lead would prevent knocking in gasoline, Dr. Kraus was asked to devise a method for the preparation of the alkyl compound on a large scale. After 3 months' work he succeeded, in the Autumn of '22, in preparing tetraethyl lead in gallon quantities efficiently through the use of the sodium-lead compound and ethyl chloride. Essentially the same process is in use today.

Saunders (A.I.M.M.E.) Medal

In '29 when copper sold for the almost unbelievable price of 18c a lb. no one thought of presenting a medal for making a copper mine pay, but James MacNaughton, the '35 recipient of the William Lawrence Saunders Gold Medal, "has accomplished notable results in making a copper mine profitable," according to the publicity released by the American Institute of Mining and Metallurgical Engineers. Mr. MacNaughton, president of Calumet & Hecla Consolidated Copper, received the Medal at the annual dinner of the Institute held at the Waldorf, N. Y. City, on Feb. 20.

George C. Stone received at the same time the James Douglas Medal, awarded annually for distinguished achievement in non-ferrous metallurgy. Mr. Stone is best known for his work in connection with the chemistry and metallurgy of zinc.

Good Work Recognized

Mallinckrodt's eastern manager, A. A. Wasserscheid is the newly elected president of the N. Y. Drug and Chemical Club, well-known luncheon club located in the downtown section of N. Y. City. The new treasurer is also a well-known

figure in the fine chemical division of the chemical industry, A. A. Teeter of Chas. Pfizer & Co.

A. A. WASSERSCHEID

Will rule through a smile instead of a lot of gavel banging

Mr. Wasserscheid joined the club in '07. He came to this city in 1890 for Mallinckrodt and became eastern manager in '13. He is one of the most beloved characters in the industry, having, literally, thousands of friends and not one enemy. His kindly, beaming countenance can usually be picked out from the throng at any chemical gathering for he gives unstintingly of his time to all movements which have the advancement of the industry as a purpose. He is a stamp collector of note.

Seen and Overheard

Lammot du Pont, president of the du Pont Company, will be guest speaker on the Forum of Liberty Broadcast over CBS, Mar. 14, at 8.30 P.M.

W. O. Brewer writes authoritatively on the interesting career of Calco's research director, Dr. M. L. Crossley, president of the American Institute of Chemists, in the January issue of *The Chemist*, official organ of the Institute.

Miss Elizabeth Metzger, daughter of Dr. and Mrs. Floyd J. Metzger, was married Mar. 2 to Dr. Howard C. Moloy. Dr. Metzger is vice-president and director of research for Air Reduction and U. S. I., and recently received the Society of Chemical Industry Medal for his work on rare gases.

Winner of the '35 "Tappi" Medal is Edwin Sutermeister, chief chemist of the S. D. Warren Co., Cumberland Mills, Me.

T. A. Wright, technical director and secretary, Lucius Pitkin, Inc., is the new president of the Association of Consulting Chemists & Chemical Engineers.

W. H. Fulweiler, chemical engineer with United Gas Improvement, is a member of the Board of Governors, Rittenhouse Astronomical Society.

Lyman S. Lloyd, vice-president, Alex. C. Ferguson, is back from a stay of a month at Miami. Louis Wirth, assistant treasurer, Buffalo Electro-Chemical was in the group.

Stephen Tyler of Thermal Syndicate is the new chairman of the N. Y. Section of the A. I. Ch. E.

Charles L. Gulick is the new president of the Compressed Gas Manufacturers' Association.

Mr. and Mrs. Lammot du Pont are at Palm Beach for a stay of several weeks.

C. Campbell Baird, Baird & McGuire president, spent February in Florida.

Frank N. Stearns, Bloomfield, N. J., is winner of the Charles M. Allen Medal of the Pratt Institute Alumni of Industrial Chemical Engineering.

Personnel

¶Haslam in a Sales Role—Witherspoon New Shawinigan President—Standard of Indiana Announces Important Changes—

R. T. Haslam is appointed general sales manager of the domestic marketing affiliates of Standard of N. J. Joining Standard in '27 Dr. Haslam later became a director of the Standard Oil Development of which he subsequently became general manager and vice-president. In '33, as senior vice-president he also took charge of the lubrication sales department of the Esso Marketers. In his new position, he remains as vice-president and executive committee member of the development company.

Now President Witherspoon

R. A. Witherspoon, formerly vice-president and general manager of Shawinigan Chemicals Ltd., is elected president of the company, which is a fully owned subsidiary of Shawinigan Water & Power. He succeeds Julian C. Smith, who has been elected chairman of the board. V. G. Bartram, formerly vice-president in charge of sales, is now vice-president and general manager.

Mr. Witherspoon, a graduate of the University of Rochester, became superintendent of the Shawinigan Carbide in '04. He later became vice-president of Canada Carbide and was elected vice-president and general manager of Shawinigan Chemicals following its formation in '27. He was recently honored by his fellow chemical engineers in the U. S. with the award of the Morehead Medal, given for outstanding work in developing the use of calcium carbide and acetylene.

Rittenhouse's New Headquarters

J. B. Rittenhouse, Synthane Corp. vice-president, is transferring his headquarters from Chicago to the main office of the company at Oaks, Pa. Mr. Rittenhouse has been associated continuously with the laminated bakelite industry since '16, and with Synthane since its inception in '28.

D. F. Jurgenson, Jr., will do research and development work at the Winnetka, Ill., laboratory of Pure Oil.

F. W. Sullivan, Jr., who has been directing Standard of Indiana's research work at Whiting, is made general research director of the company with Chicago headquarters, while W. Herbert Bahlke takes over Dr. Sullivan's work. Ernest W. Thiele, in turn, takes over the duties of assistant director.

H. J. Weiland, du Pont's research director at the Carrollville, Wisc., plant, is transferred to the Jackson Laboratory of the company.

George D. Kratz, well-known rubber chemist, will represent Vultex Chemical, Cambridge, Mass., in N. Y. City, with offices at 125 Duane st., telephone, Worth, 2-6417.

M. Y. Seaton, formerly vice-president, California Chemical, Newark, Calif., is now associated with United Chemicals in N. Y. City.

Dr. William Orr Swan, professor of chemistry at Southwestern, is appointed to the faculty of V. M. I.

M. J. McHugh is now secretary and treasurer of Consolidated Feldspar.

Forest J. Freeman, formerly with Sherwin-Williams' dry color division, is now with Standard Ultramarine.

D. K. Proffitt opens a chemical consulting office at Stockton, Calif.

Companies

¶du Pont Advertising Group Meets—Now Ohio Apex, Inc.—New Zinc Oxide Plant on the Coast—Dow Building New Stratoball—

Problems relating to advertising of products of du Pont and its subsidiaries were fully discussed at a 2-day meeting held at the Hotel du Pont, Wilmington. W. A. Hart, director of advertising, presided, assisted by R. A. Applegate, assistant director.

Advertising managers of several departments participating were E. F. Carley, R. H. Coleman, V. L. Simpson, J. A. Lyter, George Heller, S. L. Johnston, D. V. Bauder and Charles Culp.

Those from out-of-town included R. T. Ellis and Max Rosedale, du Pont Viscoloid; E. C. Harrington, du Pont Rayon; N. C. Thayer, acele department, du Pont Rayon; and P. W. Sampson, fabrikoid division, N. Y. City; F. J. Kahrs, Remington Arms, and W. A. Tewes, Peters Cartridge Company, both of Bridgeport, Conn.; M. S. Dennis and F. L. Dewey, Grasselli Chemical, Cleveland, Ohio.

Besides the advertising managers, the meeting was attended by others associated with the advertising department as follows: D. R. Rutter, assistant director of advertising; W. S. Wroten, control manager; E. R. Manchester, editor, *The du Pont Magazine*, and Brooks Darlington, assistant editor, and W. H. Uffelman, manager, du Pont exhibit, all of this city; E. C. Goekeler, manager printing plant, Philadelphia; D. J. O'Connell, manager du Pont Atlantic City exhibit, and J. H. Parker, assistant manager, C. K. Weston, director of publicity, all attended.

To Avoid Confusion

In order to avoid confusion with Apex Chemical Co. of N. Y., Apex Chemical Co. of Ohio, with factory and offices at Nitro, W. Va., changes name to Ohio-Apex, Inc. Company manufactures a line of nitrocellulose, cellulose acetate and resin plasticizers. It is one of the largest manufacturers of tricresyl phosphate. Also under license from Van Schaack Bros. Chemical Works of Chicago, and Carbide & Carbon Chemicals Corp., makes dibutoxy ethyl phthalate, which is a well known plasticizer for certain resins, particularly those of the Vinylite type.

In addition to its line of plasticizers Ohio-Apex, Inc., also makes phosphorous tri and oxychloride. Officers of Ohio-Apex, Inc., are H. S. Kreighbaum of Akron, president. Andrew A. Payne of Charleston, W. Va., vice-president. M. S. Kreighbaum of Akron, secretary and treasurer. The Nitro factory is under the direction of C. O. North as manager.

Pacific Coast Zinc Oxide

Latest chemical industry on the Coast is the zinc oxide plant of the Hughes-Mitchell Processes, Inc., located on an 18 acre tract at Torrance, a Los Angeles suburb. Plant is expected to be in full operation by mid-summer. Other zinc and lead compounds will be produced also. W. H. Rose is president, and A. Mitchell, vice-president and technical director.

Du Pont '34 Employment

Du Pont added 1,000 employees to rolls in '34, bringing total to 38,000. An additional 5,000 work for du Pont controlled but not wholly owned companies. Sale of chemicals amounted to 14% of the total in '34, as against but 4% in '24. Sale of sporting and military powders accounted for but 1% of the total du Pont sales last year.

Going Up in Dowmetal

Arthur W. Winston, Dow Chemical's Dowmetal division, reports construction nearly finished of new stratoball designed for flights this summer under the direction of the National Geographic Society.

Seeks Representations

Chemical Research Laboratories, Inc., Pittsfield, Mass., Paul W. Maynard, president, is seeking to widen its representations in the industrial chemical field. Company maintains warehouses and offices at Pittsfield.

Penick Buys

McLaughlin Gormley King, Minneapolis, sells its botanical drug line to S. B. Penick & Co. This will not affect the McL.G.K. sale of pyrethrum, derris, extracts, and disinfectants.

Niacet Chemical orders 3 tankcars from American Car & Foundry.

Minnesota Chemical adds to its personnel and warehouse facilities at 2285 Hampden ave., St. Paul.

Moves

¶Calco's New Southern Headquarters—Solvay Sales Returns to 40 Rector Street—

Calco Chemical (headquarters at Bound Brook, N. J.) has just moved into its new southern headquarters at 1112 South Boulevard, Charlotte, N. C. Calco's Charlotte office was formerly at 822 W. Morehead st. Entire new building on South Boulevard which has ample office space, is also fully equipped with laboratories and large warehouse facilities. Experienced technicians and demonstrators are at the disposal of customers.

John L. Crist, southern sales manager, is a graduate in chemical engineering of Washington and Lee. He is widely experienced in chemical manufacturing and sales organization, having with his associate, Dr. Glen M. Smyth, established and managed Beaver Chemical of Damascus, Va., from '18 to '30.

Among the specially trained Charlotte organization of salesmen, technicians, etc., the company numbers among its valuable assets, Joseph E. Moore, well known salesman in the textile industry; John E. Paulig, chief technician; James B. Grant chief chemist and others. In addition to the Charlotte establishment, the southern division of the company maintains sales representatives in Greenville, S. C., and Chattanooga, Tenn.

A Better Riverfront View

Solvay Sales' general offices, now located at 61 Broadway, will after Apr. 1 be located at 40 Rector st., N. Y. City. The N. Y. Branch of Solvay Sales is at present located at 40 Rector st., and will continue at that address.

Karl M. Herstein opens a new office in the Chemists' Club Bldg., N. Y. City, where he will continue specializing in chemical technology and patents.

Schwabacher's New Quarters

S. Schwabacher & Co., importer of Russian mineral oil, is now in larger quarters at 25 Beaver st., N. Y. City.

"The Gangplank"

¶Urey, Nobel Medalist, Meets the Harbor "Newshawks"—Marshall, A.I.Ch.E. President, Sails—

Leonia, N. J., providing a typical cross-section picture of American suburban life, rises gloriously to the occasion and honors its first citizen, Prof. Harold C. Urey, returning triumphantly from the Court of the King of Sweden, Copenhagen, after receiving the Nobel Chemistry Prize for his discovery of "heavy water." Prof. Urey chooses to receive first the plaudits of his friends and neighbors in his number one public appearance. He agrees to deliver on Mar. 27 a lecture on 'Chemistry" before the Leonia Community Association.

—Associated Press

Nobel Prize Winner, Columbia's Urey, arrives with Mrs. Urey in the Washington, March 8

When first informed of his selection as the '35 Nobel Prize winner, Prof. Urey stated: "I am lucky in being able to do just what I want to do." And, he knows too, well in advance, just what it is he wishes to do, informing the guests at the Chemists Club dinner held on the eve of his sailing, that his next study would be on the oxygen isotopes.

Marshall European Bound

Unable to get away when first planned, A. E. Marshall, president of the A.I.Ch.E., accompanied by Mrs. Marshall, finally left in the *Europa* Feb. 22 for a combined business and pleasure trip to England and continental Europe.

Hauser to the Far East

Dr. Ernst A. Hauser, chief chemist of the Semperit Austro-American Works, Vienna, and one of the world's outstanding latex authorities, is now in Japan after a tour of the leading U. S. rubber sections. He will go on to the Far East, but will return to the U. S. later on his way back to Vienna. His lecture tour here was a decided success.

Dorr's Besselievre in So. America

E. B. Besselievre, eastern manager of the Sanitary Engineering Division of the Dorr Co., sails for a year's stay in South America. He postponed his trip to officiate as president at the annual meeting of the N. Y. State Sewage Works Association, held late in January.

West Indies Visitors

George Cooper, vice-president, Prior Chemical, is on a West Indies cruise in the *Britannic*. On board the same ship is Mathieson's Kienle. Another well-known alkali man in the West Indies is Michigan's Brundage.

Chas. L. Huisking is back from his annual European trip. C. V. O'Daniel, Cyanamid vice-president, is still over on the other side.

Horace Corey, American Cyanamid fertilizer division, is in the West Indies on a 3-months' business trip.

Plants

¶R. & H.'s Harding Directs Niagara Falls Chest Drive — Solvay's Baton Rouge Plant Near Completion—General Chemical Workers Strike at Claymont Plant—

Niagara Falls Community Chest Drive will be directed by Dr. Earl A. Harding, works manager of du Pont's R. & H. plant. Assisting in the general group of leading citizens will be other prominent "Falls" chemists and plant executives. Such well-known names as Dr. Rykenboer, E. B. Speiden, Paul A. Schoelkopf, Frank J. Tone and others are on the advisory campaign committee.

An outstanding figure in community life, the general chairman of the Chest drive is a Kiwanian, a director of the Chamber of Commerce and of the Niagara Falls Community Chest, a member of the Citizens' League and of the Niagara County Health Association. He is also a member of the Niagara Club and a past grand and chief patriarch of the Odd Fellows.

A member of the St. Paul's Methodist Episcopal Church, Dr. Harding is on the board of trustees and a teacher of the adult Sunday School class. A licensed minister of the Methodist Church, he has often spoken in churches in Niagara County and Buffalo. He has appeared as a speaker before groups on subjects ranging from "Liquid Air, Its Virtues and Vices," to the "Ethics of Christian Living."

Patents Awarded Falls Chemists

Several Niagara Falls chemists have been granted important patents in the past month. Robert B. MacMullin has patented a process for the manufacture of alkali metal carbonates and hydroxides and recovery of ammonium chloride. Process contains 16 new features. Rights have been assigned to Mathieson Alkali.

Ernest W. Wescott has patented a method of producing ferric oxide by burning ferric chloride. He has been allowed claims on 19 new features and has assigned the rights to the Sulphur and Smelting Corp., of Dover, Del.

Safety After Hours

Possibilities of undertaking a campaign to teach safety outside of working hours to Niagara Falls industrial employes is being considered by the members of the industrial relations' group of the Chamber of Commerce. Discussion followed an address by N. P. Anderson, industrial relations representative of Union Carbide, at the meeting, on the topic "Safety After the Whistle Blows."

Will Ship Soon

Construction on Solvay's Baton Rouge plant is being rushed, following the ending of the recent labor difficulties (C. I., Feb., p157). Docks are finished and automatic conveyors are being set in place. Combination office and service building is nearly completed, and work is being hurried on both the ash and caustic plants. Brine pipeline, conveying this raw material from Choctaw salt domes near Plaquemine and across the river to the plant, is practically finished. Water for manufacturing will be pumped from the river. Steam lines from the plant of the Louisiana Steam Generating Corp. are erected. More than 1,500 are employed in construction, and approximately 400 will be steadily employed at the plant. Solvay took title to the property (48 acres) last July.

Ask Wage Increases

General Chemical workers (number unknown) at the Claymont, Pa., plant strike on Feb. 14 for higher wages (15c per hour) and changes in working schedules, demands being presented by Chemical Workers Union, No. 18,814, A. F. L. Plant officials report only 100 out and operating schedules uninterrupted.

Explosion Cause Unknown

Explosion at the plant of Cincinnati Chemical, Norwood (near Cincinnati) on Feb. 21 rocked the neighborhood. Dr. Oscar Frey, general manager, reports loss at $10,000 and could give no explanation for the explosion. Blast apparently came from material running through grinding mills. There were 15 in the plant at the time. Check-up revealed one dead and several severely injured.

Plant Basketball Results

Teams representing Carbide and R. & H. Chemicals are at the date of this writing still in a tie for first place in the Niagara Falls Industrial Basketball play-offs. Carbide's baseball team will open the season May 12.

The basketball team of Carbide & Carbon's Charleston, W. Va., plant, known as the "Chemists," is running away with the honors in the industrial division of the City Basketball League.

Glass Strike Settled

Strike at Pittsburgh Plate Glass' works at Creighton and Ford City is settled and the threatened workout of Libby-Owens-Ford Glass workers is removed. In each case a 5% wage increase was granted.

Cabot's Plant Contest

Godfrey L. Cabot, Inc., operating plants hold an annual safety contest. Honors for '34 go to the Eliasville plant with the Kingsmill plant a close 2nd.

Plant Personals

Corning Glass' chemical laboratory director, W. C. Taylor, is now Alderman Taylor (3rd Ward of Corning).

William C. Thompson, Midland postmaster for 11 years, accepts position in Dow's purchasing department.

Dow Increases Brine Flow

Three miles of 6 inch gravity lines with laterals to wells will be built at a cost of around $20,000 to care for 6,600 bbls. of brine which oil operators plan to send to the Dow Midland plant. Pure Oil Co. has constructed connecting lines and is feeding about 8,000 bbls. daily to the Dow plant. The Porter Brine Association is to build and operate the lines charging the members according to the number of barrels disposed of in this manner. Oil operators hope the plan will help clear the Midland water supply through stopping river dumping. Large ponds are now built in the field, but are not entirely satisfactory.

Construction

¶Westvaco Undertakes Major Improvements at South Charleston—Other Building Announcements—

Expansion and remodeling of the South Charleston plant of the Westvaco Chlorine Products that will require a construction crew of some 300 men for the greater part of the summer has begun.

M. G. Geiger, resident manager, confirmed reports that the company has undertaken a program of remodeling that will greatly increase the efficiency of the plant and make its mechanical system conform to the most modern methods.

The key men of the engineering force already have begun preliminary work and more men will be added as soon as the construction progresses sufficiently. Work will include a "substantial revamping" of the power and steam equipment and although no new buildings are being contemplated at the present, the old

boiler system will be dismantled completely and new high-pressure equipment installed.

Signs of Expansion

Cyanamid plans construction of a one-story building at its Bridgeville, Pa., plant.

Textile Dyeing & Printing Corp. of America plans a $500,000 Richmond, Va., plant for rayon dyeing and printing.

Southland Chemicals, 10 Cumming Station, Nashville, will build a $50,000 plant.

Grasselli is adding a $12,000 storage addition at St. Louis.

Automotive Production Prospects

"Dripping with optimism," is a positively mild term in reporting Detroit sentiment these days. With production of 340,000 units or more in the short month of February and the expectation of a March production of 415,000-425,000, automotive producers look confidently to a first quarter production of 1,070,000 units for the U. S. and Canada, an output exceeded only in '26 and '29, *Automotive Industries* reports:

"Unless labor disturbances should prevent, there is little question that this goal will be reached, and there is a probability it might be surpassed."

All of which promises large volume to producers of industrial chemicals, plating chemicals, solvents and lacquers. If these figures are really reached they will represent a gain of 43% over the first quarter of '34. January of this year was 90% ahead of January last year; February is thought to have exceeded the corresponding period a year ago by 40%, and March is expected to show a gain of 25%. Last year production in the first quarter was hampered by strikes in the tool and die industry. April is expected to show the peak in production for the first half.

What happens in the last half depends upon the trend in retail delivery in the 2nd quarter, but it is hoped that an additional spurt will follow the holding of a November Show and a change of models. The industry is now talking a 3,500,000 unit year.

Ford's March production is expected to reach 160,000 units. March, '33 total was 77,947 units. The total for the first quarter is expected to reach 400,000.

Colgate Earnings

Reflecting the rather general improvement in earnings of soapers, Colgate-Palmolive-Peet net earnings for '34 were approximately 10 times larger than in the previous year. S. Bayard Colgate, president, in a letter to stockholders, announced an increase of $3,370,717 over '33. The '34 net amounted to $3,744,106, he said, compared with $373,389 in the previous year.

Heavy Chemicals

¶Demand Declines Near the Close of the Month—Tin Salts Sharply Lower—Calcium Chloride Schedule Out—Mathieson Opens Houston Office—

Although a slight falling off was apparent in the final week of last month the volume in nearly all items was satisfactory and quite in line with the seasonal trend for this time of the year.

Tin Weakens

The industrial chemical market was featured by the sharp reduction in tin salts, caused by the lower price for the metal (see page 255 this issue). Whether the London metal market will stabilize now or continue to go lower was the subject uppermost in the minds of large buyers of tin salts. In general, it was felt here that final chapter in the story of the collapse of the London commodity "speculative bubble" has not yet been written. With about 8,000 tons in the hands of the buffer pool controlled by the producing countries and another 5,000 in the hands of the private London pool, a large stock is overhanging the market and hope for firm prices in the immediate future seems remote. The Tin Committee is expected to meet in London late in March to set quotas and its action is awaited with keen interest on both sides of the Atlantic.

Consuming industries, with a few exceptions, expanded manufacturing operations seasonally last month with the result that chemical shipments were heavier than in January. Plating chemicals and lacquer solvents, particularly moved out in most encouraging volume. The paint and glass industries are busier, but relatively quiet conditions still prevail in the paper and tanning fields. Caustic shipments into rayon centers are heavy. Cotton cloth production now at 85% is declining, the textile dyeing centers are again operating at lower schedules. This latter situation is expected to reverse itself very shortly. Movement in rubber chemicals reflects the high rate of activity in the tire centers.

Now On a Zone Basis

The calcium chloride schedule for the fiscal year beginning Mar. 1 has been established on a zone basis. As the result of such an arrangement the new schedule shows reductions in some sections and slight increases in others. Quotations, which are on a freight prepaid basis to destination are: Flake $22 to $35 per ton, carlots; solid $20 to $33 a ton. Paris Green prices have been extended until '35. Several of the antimony salts were higher as a result of higher prices for the metal.

Important Price Changes

ADVANCED	Feb. 28	Jan. 31
Acid naphthenic	$0.14	$0.13
Antimony oxide	.10¼	.10¾
Sodium antimoniate	.11	.10½
DECLINED		
Copper oxide, black	$0.14½	$0.16
Sodium stannate	.32	.34
Tin oxide	.52	.56
Tin crystals	.36½	.38
Tin tetrachloride	.24¾	.25½

DEPT. OF LABOR STATISTICS

	Dec.'34	Nov.'34	Dec.'33
Employment *a*	103.9	104.4	103.5
Payrolls *a*	90.0	90.7	86.6
	Jan.'35	**Dec.'34**	**Jan.'34**
Prices *b*	84.5	82.2	78.8

a 1923-'25 = 100.0; *b* 1926 = 100.0.

Hammond Heads Houston Office

Mathieson Alkali is opening a Houston sales office in the Second National Bank Bldg., with W. Scott Hammond, southwestern district manager of sales, in charge. E. M. Allen, president, and E. E. Routh, general sales manager, were in Houston and Lake Charles for several days last month.

Mathieson's January business is reported the heaviest for any January in the past 5 years.

Texas Sulfur in '34

Production of sulfur in Texas during '34 increased 9.9%, according to figures issued by the State Controller's office. During that year 1,187,679 tons were brought to the surface as compared with 1,082,681 in '33. Texas Gulf Sulphur was the largest producer, reporting 845,419 tons. Other producing companies were Freeport Sulphur, 279,555 tons, and Duval Texas Sulphur, 44,695 tons.

General Chemical Wins

General Chemical is awarded contract for 300 tons of aluminum sulfate at $1.45 in paper-lined burlap bags and $1.43 in unlined burlap bags by Niagara Falls (N. Y.) City Council. Only one bid was received.

Will Not Develop Sulfur

Jefferson Lake Oil will not develop the sulfur deposit in Lower California in which it was interested.

A Break for Paper Pulp

Georgia Senate passes a constitutional amendment exempting paper pulp industry from taxation for 15 years. Amendment must be approved by the House and ratified in the '36 election.

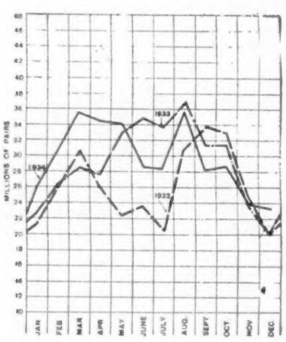
Who Makes It

We are asked by a subscriber to locate a source of supply for considerable quantities of picryl chloride 1-Chloro 2-4-6 trinitro benzine.

Textile and Tanning Chemicals

¶*Conditions in Textiles Irregular —Tanning Operations Fail to Expand — Dye Prices Firm — Rayon in Tires—'34 Consumption of Fibres—*

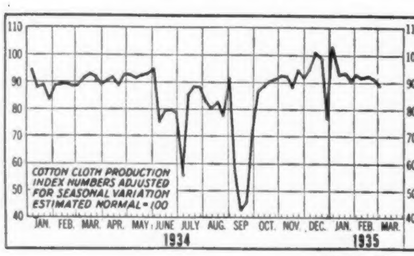
Textile and tanning chemicals could not be termed one of the "bright spots" of the chemical markets in February. Conditions in textiles are highly irregular, rayon, wool and silk centers are fairly active but cotton production



Trend in Shoe Production

while at a reported rate of 80-85% is not very evenly distributed and further contraction is looked for over the next few weeks. Tanning operations are still below the '34 level.

Cotton Cloth Production



—N. Y. Times

Cotton Cloth Production is Declining

Dye prices remain firm despite the irregularities in the demand. Egg yolk is extremely firm with a scarcity of stocks, Gambier is higher for the same reason. On the other hand, with the exception of Italian sumac, most of the natural tanstuffs are lower when compared with prices prevailing at the end of January. A lessened demand is the answer. Bichromate is moving out in fairly satisfactory quantity to the dry color field, but shipments to the tanning centers are still disappointing. The competitive situation in red prussiate is still noted. Corn derivatives are strong. A larger demand for aluminum chloride is reported by some of the producers.

Furness Reorganizes

Federal Judge John Boyd Avis confirms plan for the reorganization of the bankrupt Furness Corp., rayon producer at Gloucester City, N. J. Highly interesting was the disclosure that the company and du Pont Rayon hold exclusive rights to the manufacture of automobile tires in which rayon is substituted for cotton cord. Willis T. Porch, counsel for the former president of Furness, protested against the plan, claiming that the contract on tire manufacture was made personally by his client with du Pont and should not be included in the new company's assets.

It is said that substituting rayon for cotton cord in tires lessens the danger of blowouts because the former is more resistant to heat. Further, it is reported that the technical problems involved in the manufacture are close to complete solution. Such a substitution (if complete) would require about 25,000,000 lbs. of rayon.

The other big development awaited in the rayon field is the work being done in introducing dyes directly into the solution, which would, of course, revolutionize the dyeing trade. No definite information is obtainable as to how successful the experiments along these lines have been to date.

Important Price Changes

ADVANCED

	Feb. 28	Jan. 31
Egg yolk	$ 0.56	$ 0.46
Gambier, common, ship.	.06½	.06¼
Sumac, grd., ship.	58.00	57.00
Zinc dust	.057	.0585

DECLINED

Mangrove bark	$29.00	$30.00
Myrobalons J1	24.00	25.00
J2	15.00	15.25
Valonia beards	42.50	43.50
Cups	27.50	28.50
Wattle bark	29.25	32.00

DEPT. OF LABOR STATISTICS

	Dec.'34	Nov.'34	Dec.'33
Textiles:			
Employment a	92.8	90.9	88.0
Payrolls a	75.3	71.1	64.0
Leather:			
Employment a	84.8	81.6	78.7
Payrolls a	69.1	61.0	61.1
Dyeing and Finishing Textiles:			
Employment a	114.8	91.4	105.6
Payrolls a	99.6	73.2	83.3

a 1923-'25 = 100.0.

'34 Boots and Shoes

An increase of 1.9% in production of boots and shoes over the preceding year is reported for '34. Total production for factories reporting was 357,119,401 pairs, compared with 350,381,737 pairs in '33.

Personal Items

Victor H. Berman, Onyx Oil & Chemical's president, is appointed by Gov. Harold G. Hoffman of New Jersey to serve with former Gov. "Al" Smith as a member of the Palisades Interstate Park Commission.

Dr. Harry E. Smith, chief chemist of Clarion Chemical, N. Y. City, speaks before the N. Y. Section of the A.A.T.C.& C. on "Pine Oil and Pine Oil Penetrants as Used in the Textile Industry."

Closer Liaison

Closer liaison between members of the Tanners' Council and its Research Laboratory at the University of Cincinnati is expected to follow the appointment of a committee which will direct the general activities of the department. Appointees are: George B. Bernheim, Chairman; E. H. Ellison, Jr.; Victor G. Lumbard; E. L. Nelson; R. P. Butler; Percival E. Foerderer, ex-officio; Fraser M. Moffat, ex-officio.

A Decrease of 13%

Consumption in '34 of textile fibers—cotton, wool, silk and rayon—aggregated 3,164,000,000 lbs., a decrease of 13%, compared with consumption of 3,646,-600,000 lbs. in '33, according to the *Textile Organon*. Consumption of all fibers registered a decline from the previous year of 13% for cotton, 26% for wool, 2% for silk, and 4% for rayon. With the exception of '33, consumption of rayon was the largest for any year on record. Silk consumption was the smallest for any year since '24; wool consumption the smallest in more than 15 years.

FIBER CONSUMPTION

	Cotton Pounds*	Wool Pounds*	Silk Pounds*	Rayon Pounds*
'34	2,662,900	240,200	61,400	199,500
'33	3,052,500	324,300	62,400	207,400
'32	2,457,600	240,900	73,700	152,200
'31	2,656,700	320,900	79,100	157,300
'30	2,608,300	268,800	77,400	117,200
'29	3,426,300	365,600	82,400	131,300
'28	3,187,400	336,600	75,900	100,100

American Maize Appoints

American Cyanamid & Chemical is appointed selling agents by American Maize Products on its Amaizo Tanners corn sugar.

Puritan Dye Starts Up

Puritan Piece Dye Works opens in Paterson to do piece dyeing of rayon acetate and mixed fabrics.

Starch from "Sweets"

According to newspaper reports the plant started at Laurel, Miss., through PWA funds, for the manufacture of starch from sweet potatoes is operating at full capacity.

Dean Whitmore Suggests

Neglect of scientific genius is charged by Dean Frank C. Whitmore of Pennsylvania State College, a director of the A. C. S., in a letter to David I. Walsh, chairman of the Senate Committee on Education and Labor.

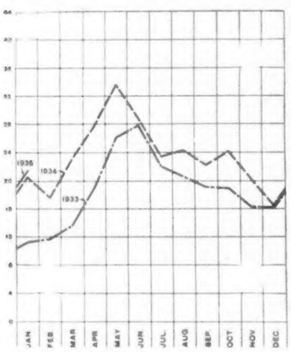
The nation has been guilty of wasting a major portion of the "God-given genius" of Father Julius A. Nieuwland of Notre Dame, Dean Whitmore declares in urging the Federal Government to sponsor a planning system which would provide jobs for young science graduates as aids to struggling scientists.

* 000 omitted.

Paints, Lacquers and Varnish

¶Paint Industry Expands Seasonally—Casein Prices Again Rise—Our Exports Gain in '34—Paint Campaigns — Breyer Attacks Paint Code Authority—

Demand for raw materials by paint manufacturers was just about the only division in the industrial chemical field where expansion rather than contraction took place in February. This, of course, was in keeping with the usual seasonal trend. March is expected to see the peak in this upward movement.



Trend in Paint Sales

Casein Stocks Scarce

The steady advance in casein prices over the last few months was again extended in February and 20-30 mesh domestic material is now quoted on a basis of 13c. Stocks are extremely low and are expected to continue so for at least 2 months. This scarcity opens up the possibility that Argentine material may again come in in quantity. Red Lead and litharge are fractionally higher as a result of a firmer market for the metal. Because of changes in the basic metals involved, antimony white pigment is 1¾c. higher and mercury oxide, red, 5c and yellow, 3c lower. In the case of the mercury pigments, the current price revisions do not reflect any recent weakness in metallic mercury, but rather a delayed readjustment of prices. Rumors are heard in the trade of the likelihood of higher French Ochre prices shortly. Based on what seems to be sound reasoning (the sharp advances in the last 2 months in stearic acid), a substantial advance in the stearates is expected.

Users of the various phthalates, diamyl, dibutyl and dimethyl, are now enjoying lower prices, the cuts ranging from 1½c to 2c a lb. With this reduction these plasticizers are more competitive in price.

Construction awards in 37 Eastern States during January exceeded the total for December by about $7,000,000 or almost 8% according to F. W. Dodge Corp. January total of $99,773,900 for all classes of construction, however, was only 53% as great as the total of $186,463,700 reported for January, '34. However, January of '34 was a peak month for PWA contracts, which should be taken into consideration in any comparison. A pick-up in residential contracts in January of 53% over December, '34 and 48% over January '34 is reported, but the total was only 40% of the January '31. The Dodge Bulletin states:

"For the first quarter of '35 it is probable that residential building awards will exceed the total of $57,706,800 for the corresponding period of '34 but it is not likely that the percentage gain for January can be maintained for the quarter as a whole."

Important Price Changes

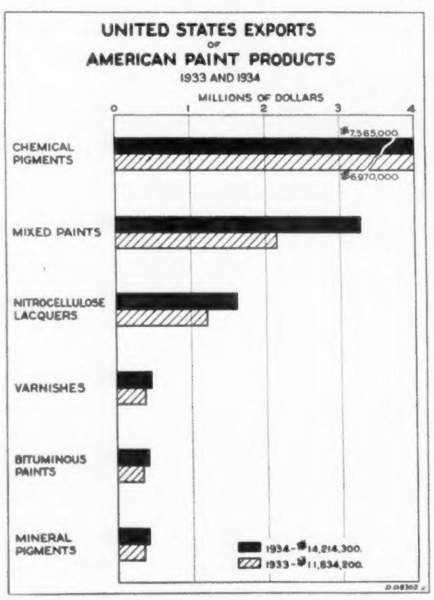
ADVANCED	Feb. 28	Jan. 31
Antmony white pigment	$0.09½	$0.07¾
Casein, 20-30	.13	.10½
80-100	.13½	.11¼
Red Lead	.065	.06
Litharge	.0505	.05
DECLINED		
Mercury oxide, red	$1.12	$1.17
Yellow	1.12	1.15

DEPT. OF LABOR STATISTICS	Dec.'34	Nov.'34	Dec.'33
Employment *a*	99.5	99.7	90.1
Payrolls *a*	78.1	78.5	68.8
	Jan.'35	Dec.'34	Jan.'34
Prices *b*	79.0	78.8	78.4

a 1923-'25 = 100.0; *b* 1926 = 100.0.

'34 Exports, $14,214,300

One hundred countries bought $14,214,300 worth of American paints, varnishes, lacquers, chemical pigments, etc., compared with $11,834,200 in '33, a gain of 20%. Chemical pigments total was $7,565,000, an increase of approximately $600,000, but a decline in quantity from 170,000,000 lbs. to 120,650,000, due almost entirely to smaller carbon black shipments, most important item in the chemical pigment group. Even in depression years carbon black exports have shown advances and current decline is, therefore, most interesting. Other items compare:



Ready mixed paints, 1,812,500 gals. ($3,270,800), an increase of 50% in quantity and 52½% in value compared with '33; varnish (355,000 gals.) had only a slight quantity increase but value increased 17% to $457,500; nitrocellulose lacquers (1,007,000 gals.), an increase of 40% in quantity and 34% increase in value, to $1,602,600.

N.P.V. & L.A. Notes

Impressive evidence that "Things Don't Just Happen" but are made to happen through definite, organized action of the N. P. V. & L. A., for the benefit of the members of the industry, is contained in the new membership manual of the Association, which has just been completed and placed in the hands of all members of the National Membership Committee, and the secretaries of all local Paint, Varnish and Lacquer Associations.

Campaigns Start

Chicago's annual Clean Up-Paint Up-Plant Up-Fix Up Campaign has been planned on a greater scale than ever before, for '35, with the dates for the intensive drive, Apr. 22-May 4. Plans for Kansas City's Campaign are well under way. The Kansas City Paint, Varnish & Lacquer Association is energetically supporting and cooperating with the Kansas City Chamber of Commerce in preparation for the activities. Merle Smith, J. C. Nichols Companies, is chairman of the civic committee, and Jason Jones is chairman of the Clean Up and Paint Up Committee of the Kansas City Paint, Varnish & Lacquer Association.

Modernization Figures

Increased activity in modernizing and repairing was evident throughout the country as the Better Housing Program of the F. H. A. ended its 6th month of existence.

The 1st month of the year generally shows a seasonal decrease of about 12% under December. January, '35, however, showed a general increase of 21.1% in alterations, additions and repairs over December, '34. There was also an increase of 15.9% over the previous January. These figures, compiled by the Bureau of Labor Statistics, Dept. of Labor, are based on reports from 776 cities and towns.

The estimated amount of modernization and repair work reported by field offices of the F. H. A. in all parts of the country as chiefly the result of the Better Housing Program, totaled $271,918,789 on Feb. 23.

National Lead "Resists"

National Lead is "resisting" an attempt to force it into the "ready to use" paint code. Chairman Cornish, reporting to stockholders, states: "At present we are a member of the lead industries' code and refuse to enter into any codes which involve price fixing or limitation of output."

Demands Changes in Paint Code

A scathing attack on the Code Authority of the paint industry is contained in a letter written by Frank G. Breyer and J. P. Hubbell, of Singmaster & Breyer, to the Consumers Advisory Board of NRA. This firm largely directed the opposition of a number of lacquer companies against the du Pont licensing plan under the Flaherty patents. Opposition suddenly collapsed when the Glidden Co., against whom a test case was made by du Pont, agreed to accept a modified du Pont licensing agreement.

Letter asserts that the Paint Code was written by the National Paint, Varnish & Lacquer Association and that the present code authority is practically identical with the management of the Association; that raw material producers or paint companies affiliated with raw material producers contribute money to the Association for its work. It demands that "either the Code Authority recognize the fundamental conflict of interest between the paint manufacturers who buy their material in the open market and the raw material producers, who own and operate paint companies and require raw material producers to circulate the same information regarding replacement costs as is required of paint manufacturers, or else that the Code Authority should be turned over to the paint manufacturers to prepare and administer their own code without interference from the raw material interests."

Claiming to speak for the "little paint man," Breyer and Hubbell state: "It is important that action should be taken quickly. The 1500 or more independent paint, varnish and lacquer manufacturers in the country are being gradually starved. The Code is one of the important factors which is helping to starve them. . . . Natural forces favor a decentralized paint industry. With artificial handicap removed the well run, independent manufacturer can more than hold his own. If these handicaps are not removed, concentration will proceed at an accelerated pace."*

Paint Personnel

Clarence H. Brown, Renshaw Smith, Jr., and J. S. Long are elected Devoe & Raynolds' directors, succeeding C. B. Hubbard, A. W. Francis and William S. Gray, Jr. Latter is president of William S. Gray & Co., and also one of the youngest bank presidents, heading Hanova, one of the largest in N. Y. City.

Nu-Enamel Corp. is reported ready to enter the house paint field. Sam. A. Stephens is now in charge of sales and advertising and Charles E. Steffey will direct house paint sales.

* Paint Industry Recovery Board is mailing a questionnaire to all members of the industry asking for opinions, suggestions, etc. on NRA.

Gums, Waxes

¶A Wild Speculative "Bubble" Explodes in London with Disastrous Consequences—

Some one, sniffing too heavily of the huge white pepper stocks piled to the rafters in London's Limehouse warehouses, "sneezed" and Great Britain's latest wild speculative commodity bubble burst with a loud "bang" last month and the repercussion is felt all over the world. An impressive list of honored London commodity houses in famous Mincing Lane district, including the well-known Strauss firm, James & Shakespeare, J. F. Adair & Co., Rolls & Son, are "posted" as casualties.

With little popular interest in stocks, a group of London speculators, led, it is said, by one Garabed Bishirgian, a mysterious ex-Armenian rug dealer and fabulously wealthy bachelor, whose stag parties were the talk of London for the past 2 years, decided last Spring to stir up a little more than idle public curiosity in Indian commodities, pepper, oilseeds, shellac, etc. For months the group accumulated vast holdings in these commodities, confident that a "corner" in many or all would pay handsome rewards, but ill-luck dogged their footsteps in the form of large current crops.

Shellac stocks in London reached the unheard of total of 300,000 packages on Jan. 1, '35, but long before this, the pool, sensing impending defeat, attempted to "sell" the advantages of a N. Y. shellac futures market to the larger American factors, but failed.

After desperate but futile last minute appeals to leading British banking firms and to Montague Norman and the Bank of England, the inevitable crash came in January and the first 10 days of February. Shellac tumbled with the rest and finally the "no trading" sign was hung out by the London shellac market. On Feb. 9 it was reported by cable from London that a subsidiary of Tobacco Securities, Ltd., was taking over the bulk of the pool's shellac holdings.

Statistics indicate how indigestible the shellac stocks in London finally became. Imports totalled 439,517 cwts. in '34 as against only 170,044 in '33, and a large part of this increase occurred in December and early January. Reports from London indicate that 120,000 cases (19,680,000 lbs.) were scheduled to arrive during March and April. With the supply on hand 313,499 cases (51,413,836 lbs.) the March-April imports would bring the total to the huge figure of 71,093,836 lbs. The shellac trade in N. Y. City, however, doubts the veracity of these figures, particularly the probable March-April imports.

In the local markets trading was at a very low ebb with buyers waiting further developments in the unusual situation before making commitments. The following price comparison indicates the market trend.

	Dec. 31	Jan. 31	Feb. 28
Bone Dry	30c	25c	21c
T. N.	23	18	14
Garnet	26	22	19
Superfine	26	21½	17

	Dec. 31	Jan. 31	Feb. 28
T. N. Calcutta	18¼c	15⅜c*	11c
March Position, Lond., T. N.	85 s.	no market	

Waxes Advance

Announcement of the Supreme Court's gold decision brought about greater stability in wax prices and relieved the uncertainty that has hung over the markets for several weeks. Importers have placed forward orders in nearly all items which will correct the scarcity of stocks. Candelilla and Japan were advanced ¾c and a ¼c respectively and the importers of Carnauba, apparently feeling that the decline of a month ago had been somewhat overdone, raised quotations sharply. The primary Brazilian market is also much higher, recent cable advices disclose.

Important Wax Price Changes

ADVANCED

	Feb. 28	Jan. 31
Candelilla	$0.10¾	$0.10
Carnauba, No. 1, Yellow	.36½	.35
No. 2, Yellow	.36	.34
No. 2, N. C.	.28	.26½
No. 3, Chalky	.24½	.21½
No. 3, N. C.	.26	.22½
Japan	.06¾	.06½

Varnish Gums Steady

The varnish gums are steady with but 2 or 3 very minor price changes. Importers are again active in the primary markets with the doubt over the "gold clause decision" finally removed.

Byrnes' New Connection

James W. Byrnes, president, James W. Byrnes Shellac, becomes vice-president of Ma-Lac-Kasebier-Chatfield, and his company will be liquidated.

Miscellaneous Notes

Reorganization of the curriculum in chemical engineering at Washington University (St. Louis), following the standards set up by the A. I. Ch. E. has been announced.

James F. Hodge, Rogers, Ramsay and Hodge, speaks before the Philadelphia Drug Exchange Feb. 26 at the Penn Athletic Club on "Food and Drug Legislation."

Zapon's Rudolf Neuburger addresses Association of Advertising Men, N. Y. City, on production, distribution and their relation to money.

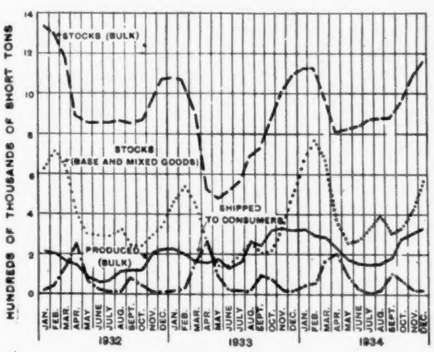
* Represents a "pegged price."

Fertilizers

¶February Tonnages Somewhat Disappointing—Organic Ammoniates are Lower After Several Months of Rising Prices—Proposed Legislation—

Seasonal expansion in the movement of fertilizer materials is reported, but the total tonnage in February was somewhat below earlier expectations. This same statement is equally true of the movement

Trend In Superphosphates



of mixed goods to the agricultural regions. Cold weather in several sections is held responsible for this drag and suppliers of raw materials and mixers are optimistic over the outlook for March and April. Florida growers have recovered their confidence on finding that the damage from the January cold spell was not as great as first feared and are in the market for top-dressing materials in encouraging quantities. Sales are slower in Georgia and northern markets are quite dull as yet. Without the former encouragement of discounts for early buying there will be, undoubtedly, some slowness on the part of buyers to take requirements until urgently needed.

Price movements were relatively few last month. Most of the organic ammoniates went lower, reversing the upward trend in these materials over the last few months. The index of fertilizer material prices of the National Fertilizer Association declined from 65.8 (on Jan. 26) to 65.5 on Mar. 2, a loss of .3 of a point, while the index of mixed fertilizer prices declined .4 of a point, or from 76.5 to 76.1 in the same period.

Cotton Exchange Review

Southern cotton growers are buying fertilizer less freely than at this time last year, according to a report issued Feb. 11 by the N. Y. Cotton Exchange Service. However, report states, they are buying more freely than 2, 3 or 4 years ago. A considerable portion of the fertilizer sold in the South is used on other crops than cotton, and only a small percentage of the total cotton acreage is

Important Price Changes

ADVANCED	Feb. 28	Jan. 31
None.		

DECLINED		
Blood, Chgo.	$ 3.25	$ 3.65
Imported	3.00	3.10
Bone Meal	23.00	23.50
Hoofmeal	2.50	2.65
Tankage, N. Y., unground	2.40	2.50
Imported	3.00	3.15

DEPT. OF LABOR STATISTICS	Dec.'34	Nov.'34	Dec.'33
Employment *a*	99.5	99.2	94.8
Payrolls *a*	75.5	69.7	68.5
	Jan.'35	Dec.'34	Jan.'34
Fert. mat. prices *b*	66.5	65.3	68.4
Mixed fert. *b*	73.3	73.7	71.2

a 1923-'25 = 100.0; *b* 1926 = 100.0.

fertilized. In the eastern part of the cotton belt fertilization is heavy, while in the western portion very little fertilizer is used. Report continues:

During December and January this season tags were sold for 294,000 tons of fertilizers in the principal cotton-growing States as compared with 409,000 during the corresponding 2 months last season, 173,000 2 seasons ago, 120,000 3 seasons ago and 272,000 4 seasons ago. However, early-season fertilizer sales do not furnish a reliable indication of how much fertilizer farmers may buy for use during the season, since farmers buy a larger proportion of their fertilizer in the early months in some seasons than in others. . . .

Proposed Legislation

Senate Bill 1891, introduced by Senator Byrd, and a companion bill, H. R. 5854, introduced in the House by Congressman Bland, to amend the Revenue Act of 1934, provide for a duty on a number of products, and a processing tax on certain oils. Bills propose a duty of 1c a lb. or $20.00 a ton on "tankage, animal and vegetable scrap, cake, oil cake, and oil-cake meal (including fish and marine-animal meal)." The tax would be retroactive to May 10, '34.

Bill is before South Carolina legislature to compel packing of fertilizer in cotton bags.

With the Companies

Etiwan Fertilizer, oldest acid producing plant in Charleston area, passes to W. R. Sullivan for reported price of $150,000. John E. Gibbs, Charleston, will be president.

Silmo Chemical at Vineland, N. J., suffers a $15,000 loss when 4 outbuildings and the office are destroyed by fire.

Lyons Fertilizer's plant at Tampa is destroyed by fire with a $300,000 loss.

Newark Joint Meeting Sewer Commission is asking fertilizer manufacturers to erect a factory next to the proposed $250,000 sludge plant. Bids will be received.

Violent windstorm destroyed portion of the half constructed fertilizer factory of Kingsbury & Co., located at Peru, Ind. Company headquarters are at Indianapolis.

Fertilizer Personnel

Henry S. Treide and Chester F. Hockley are confirmed as permanent trustees of Davison Chemical.

John P. Stedman joins Royster Guano as assistant treasurer.

Died Last Month

C. C. Lowrey, 58, Royster Guano advertising manager, on Feb. 11.

Coal Tar Chemicals

¶Toluol Demand Continues—Better Call for Naphthalene—Coke Production Increased in January—

Exceptionally heavy demand for toluol, xylol and solvent naphtha continues to feature the coal tar markets as it has done for several months past. Seasonal increase in demand for naphthalene is noted and a strengthening in the price structure of refined is reported. The situation in benzol continues to be somewhat irregular. Movement of intermediates into consuming channels is spotty and is caused by the uncertainty in the textile field and a desire on the part of buyers to hold commitments down to actual immediate needs. A very firm price situation is developing in creosote oil. Phenol is quiet, but the volume is satisfactory.

Important Price Changes

ADVANCED	Feb. 28	Jan. 31
None.		

DECLINED		
Acd cresylic, 99%, East	$0.42	$0.46

Coke production increased sharply in January, to the highest level since that of June, '34. January daily rate of 93,632 tons, from by-product and beehive plants, was 15.1% above that of December and 11.7% more than the rate prevailing in January a year ago.

Production of by-product coke for the month amounted to 2,801,552 tons, or 90,373 tons per day. Compared with December, the January rate increased 15.9%. Expending blast furnace operations resulted in a gain of 43.8% in the daily rate of pig iron production; responding

to this activity coke production at furnace plants increased 29.1%, while that at merchant plants declined 2.7%. The output of beehive coke for the month dropped from 3,344 tons per day in December to 3,259 tons in January, a decline of 2.5%.

Stocks of coke at by-product plants at the close of January were 8.4% less than at the beginning of the month. Bulk of the decrease occurred at merchant plants. Present reserves are 25.0% below the same period of '34.

Naval Stores

¶Prices Stationary in Dull Trading—Uselessness of Present Stock Statistics—

The rosin markets failed to expand in the past month and trading was of a desultory nature throughout the 30-day period. The truth is that February's trading was very disappointing. Price fluctuations were very narrow, not over 5c in any one of the grades. Turpentine, likewise, moved but little, closing out the month at Savannah with a ¼c decline.

Rosin stocks declined at both Savannah and Jacksonville last month; Savannah turpentine stocks declined, but the Jacksonville stocks increased.

SAVANNAH ROSIN MARKET

	Jan. 31	Feb. 28
B	$4.00	$3.95
D	4.00	4.00
E	4.20	4.20
F	4.65	4.65
G	4.65	4.70
H	4.70-4.75	4.70
I	4.70-4.75	4.70
K	4.75	4.72½
M	4.75-4.80	4.75
N	5.15	5.15
W. G.	5.60-5.65	5.60
W. W.	6.20-6.25	6.20
X	6.20-6.25	6.20
Spirits Turpentine	50½c	50¼c

ROSIN STOCKS

	Savannah	Jacksonville
Jan. 31, 1935	91,654	144,406
Feb. 28, 1935	58,902	123,662

TURPENTINE STOCKS

Jan. 31, 1935	13,919	48,850
Feb. 28, 1935	11,572	58,902

Misleading Figures

For sometime now it has been recognized that the statistics of stocks as published by the Savannah Board of Trade and similar reporting agencies in the other primary ports of Jacksonville and Pensacola are grossly inaccurate and hence misleading. This, everyone understands, is no reflection on these various reporting agencies, but has been caused by the lack of full and complete statistics on holdings in private yards and stocks on which government loans have been placed.*

Steps are being taken to set up a new statisical reporting agency for coming season which begins April 1.

Solvents, Petroleum Chemicals

¶Petroleum Solvents Steady—Paint, Lacquer and Rubber Fields Active—Methyl Acetone 5c Lower—

Steady prices prevailed throughout the past 4 weeks in the petroleum solvents field. Midcontinent, East Coast and Pacific Coast markets were without important price changes. Demand was spotty, but the paint trade and the rubber manufacturers continued to take sizable quantities, making up in part at least for the dullness in other important consuming fields.

Important Price Changes

ADVANCED

Feb. 28 Jan. 31

None.

DECLINED

Methyl acetone 5c reduction in schedule.

DEPT. OF LABOR STATISTICS

	Dec.'34	Nov.'34	Dec.'33
Petroleum:			
Ref. employ. a	110.7	111.9	111.2
Ref. payrolls a	97.8	96.8	89.4
	Jan.'35	Dec.'34	Jan.'34
Products, prices b	48.8	49.8	51.1

a 1923-'25 = 100.0; b 1926 = 100.0.

March Allowable

Crude oil production allowable is set at 2,520,300 bbls. daily for March, a decrease of 5,800 from the February average. Oil Administrator Ickes announces decrease is due to a comparable decline in gasoline production necessary to meet current demand so as to provide adequate inventory conditions for the opening of the spring trade season. Largest decrease was authorized for Texas, a cut of 11,600 bbls., to 1,020,100.

Alcohol Status Satisfactory

Alcohol producers are said to be fairly well satisfied with the anti-freeze volume although it did not reach, it is generally believed, the high total of the previous year. Movement of material into industrial channels is satisfactory with the exception of the shellac cutters and prices are stable. Molasses was increased a ½c late in the past month. About 100,000,000 gals. of Porto Rican blackstrap became available to alcohol producers following an AAA ruling that shippers will now be permitted to ship surplus for the account of either alcohol producers or the stock food manufacturers.

Other solvents are moving out in encouraging volume with the lacquer producers in the van. March is expected to see a continuance of this movement, but beyond that the picture becomes a little more uncertain. Production of automobiles for March is expected to total 425,000 units. Sales of cars are holding up so that a busy April is a fair enough guess although no preliminary estimates on production are available as yet.

The lower quotations on the important phthalates are reported in the Paint Section. Natural methyl acetone is 5c lower. The basic tankcar price is now 44c.

Special Solvent Regulations

Treasury regulations regarding the shipment of special solvent grade of alcohol have been changed to permit deliveries to be made in tank-trucks. Under written authorization, shipments in tank-trucks or tankcars owned by the solvent manufacturer to actual users for solvent or manufacturing purposes, and not for resale, are to be permitted.

Fine Chemicals

¶Producers Enjoy Good Business—Tartar and Vanillin Lower

Producers of fine chemicals report that February sales were equal to or, in some cases, better than January. With the Supreme Court's decision on the so-called gold clause out of the way, importers of raw materials felt more inclined to make commitments and prices of items of this character were generally firm. Considerable interest was aroused here over the reported agreement between British citric acid producers and foreign manufacturers. According to reports, British producers using the fermentation process are included. Agreement is said to be provisional as yet and that a further meeting is scheduled for June. Just what effect, if any, this will have on the citric market in this country is hard to say at the moment, but it does present interesting possibilities. Refined glycerine price is firm and unchanged and stocks of the various crude grades are still scarce, indicating continuance of present levels for the refined.

Important Price Changes

ADVANCED

	Feb. 28	Jan. 31
Adeps Lanae, Anhyd	$0.16	$0.15½
Hydrous	.15	.14¾
Phenolphthalein, U. S. P.	.60	.50
Yellow	.57	.47
Silver nitrate	.39⅜	.38

DECLINED

Ammonium chloride, U. S. P.	$0.12½	$0.13
Ammonium phosphate, debasic, U. S. P.	.34	.35
Cream of Tartar, cryst.	.17¼	.17¾
Powd.	.16¾	.17½
Vanillin	3.00	3.25

DEPT. OF LABOR STATISTICS
(Drugs & Pharmaceuticals)

	Jan.'35	Dec.'34	Jan.'34
Price a	73.1	73.4	65.2

a 1923-'25 = 100.0.

Oils and Fats

¶Prices "Skyrocket" to New Depression Highs—Rise in Silver Affecting Chinawood and Other Oils—Cottonseed Oil Nets a Gain—

Spectacular advances again occurred in the fats and oils last month, running practically the entire list up into new highs. Unlike last month when trading was exceptionally light, buyers were in with actual orders in the past 4 weeks and a sizable amount of tonnage changed hands. Announcement of the "Gold Clause" decision by the Supreme Court early in the month helped to broaden the trade and brought in buying that had been held in abeyance temporarily awaiting the outcome.

The oils and fats price index, as compiled by the Bureau of Raw Materials for American Vegetable Oils and Fats Industries, increased from 91.2 for the month of December, '34, to 96.9 in January, '35. That of the National Fertilizer Association increased from 80.0 on Jan. 26 to 84.7 on Feb. 23.

Cottonseed and Linseed

The fireworks of the last few months were largely missing in the cottonseed oil markets in February and the volume of trading declined sharply. Nevertheless, a slight net gain was made when prices on Feb. 28 are compared with the close on Feb. 1. A detailed comparison follows:

BLEACHABLE PRIME SUMMER YELLOW

	Feb. 1	Feb. 28	A year ago
March	11.09-11.14	11.55-11.65	5.08-5.20
April	11.08-11.18	11.60-11.75	5.10-5.30
May	11.11-11.15	11.74-11.78	5.24-5.27
June	11.08-11.18	11.75-11.90	5.25-5.45
July	11.15-11.18	11.87-11.88	†5.49
August	11.18-11.23	11.88-11.98	5.50-5.70
Crude Southeast	10.00	10.50*	
Texas	10.00	10.50*	
Valley	10.00	10.50*	

† Sale; * Nominal.

Trading in linseed oil remained light during the past 4 weeks, continuing the state of relative disinterestedness on the part of the majority of buyers that has characterized this commodity for several months. Despite this indifference and a slight weakening in the flaxseed markets, a slight increase in linseed was registered. Cake and meal prices, on the other hand, were much lower.

	Jan. 31		Feb. 28	
	May	July	May	July
Duluth	$1.87	$1.87½	$1.82¼	$1.82
Winnipeg	1.46	1.44½	1.44½	1.42⅞
Minneapolis	1.85	1.87	1.80	1.82¼
Buenos Aires	...	.99½	...	.98⅝

	Jan. 31	Feb. 28
Boiled, tanks	$0.089	$0.091
carlots, cooperage	.095	.097
l. c. l. lots	.099	.101
Raw, tanks	.085	.087
carlots, cooperage	.091	.093
l. c. l. lots	.095	.097

There is further talk in Washington regarding a processing tax on flaxseed. It will be recalled that flaxseed was made a basic commodity at the last session of Congress. Reports from Washington indicate that the present program of the AAA calls for a reduction in the present tariff on flaxseed from 65c a bushel to 32.5c, and the levying of a processing tax of about 35c. The processing tax is to apply to imported as well as domestically produced flaxseed.

Reports from England indicate that linseed is the cheapest vegetable oil in Europe now and that soap and edible users are switching.

Chemical Specialties

¶Considering the Food and Drug Bills—Other Annoying Legislation—New Companies, Products, Packaging—

Legislative Committee, National Association of Insecticide & Disinfectant Manufacturers, considering carefully various food and drug bills before Congress, reach conclusion that the best method of accomplishing the desired effect is through an amendment to the existing law rather than through the enactment of entirely new legislation.

Bulletin points out that all bills define as a drug "all substances, preparations, and devices intended for use in cure, mitigation, treatment or prevention of disease in man or animals." Word "prevention" would certainly bring into the scope of the law all disinfectants and many household insecticides, Bulletin states.

Various State Bills

A number of bills are before various state legislatures that would restrict to drug stores employing registered pharmacists the sale of a number of chemical specialties. Bills of this nature have been introduced in N. Y., Nos. 545, 546, 547 and 548; N. J. Bill No. 197, Indiana Bill No. 130, Minnesota Bill No. 413 and Oregon Bill No. 82. Bill No. 82 in Oregon has already passed both Houses of the State Legislature. These bills restrict the sale of all poisonous or deleterious materials such as insecticides, pipe cleaning compounds, disinfectants, etc. In N. Y. it has been ruled that the law will apply to any product in which the entire contents of the retail package, or any part thereof, when taken at one time is poisonous or deleterious. In every case the term "medicine" is defined in such a way as to include all of the disinfectants manufactured and many of the household insecticides. The N.I.&D.M.A. is actively fighting all this legislation and is urging members and all manufacturers to register protests.

Higher Soap Prices

Soapers anticipate higher prices shortly, sharp advances in raw materials making such a move imperative. Including the processing tax soap oils are up over 300%, tallow 200% from last year's low prices. What advances have been made in soap prices in the past 6 months do not compensate for the rise in raw materials.

With the Companies

Babbitt will use 150 papers of 90 cities in its spring drive for "Bab-O." Promotion of "Wet-Me-Wet" washing powder will appear in the "Bab-O" series, and the 3 brands of Babbitt's lye will be featured in farm papers.

Enoz Chemical returns to the air with a new series in its "Wooley-the-Moth" series.

Founders Paint, Milwaukee, is now ready to market on a national scale its cleanser "Lazy Man's Cleaner."

Rotenone Chemical, manufacturer of insecticides, is now in larger quarters at 1850 Manhattan Place, Los Angeles.

"Magic" Expansion

"Magic," a bleaching compound, is to be manufactured by Magic Manufacturing, East Washington st., Charleston, W. Va. Company operates similar plants at Niagara Falls and Buffalo.

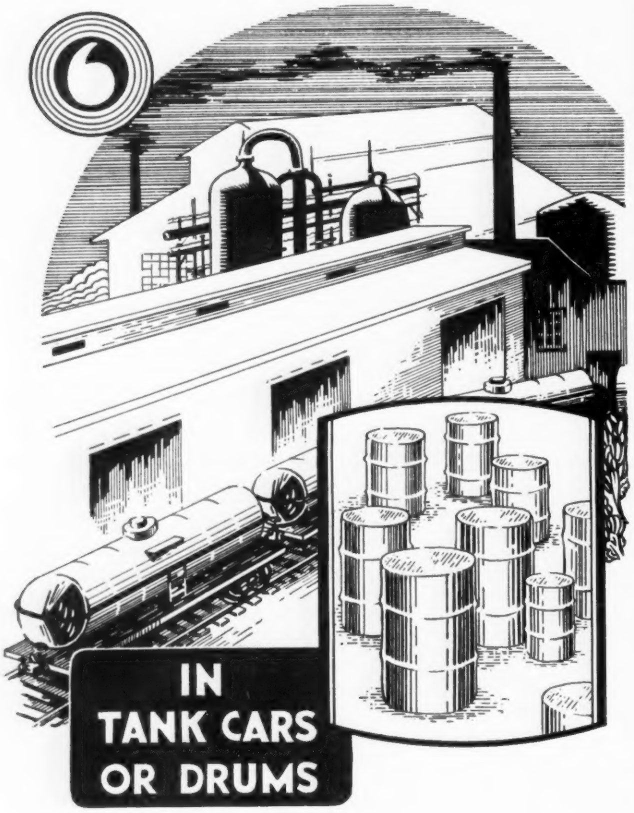
Completely Redesigned

Clover Farm Stores Corp. redesigns packages of its varied soap products. Wrappers are by McDonald Printing, Norwood, Ohio, and cartons by Central Carton, Cincinnati.

Crude and synthetic methanol '34 production statistics by months are given. Figures for December account for 78.2% of the crude and 100% of the synthetic.

Month 1934	Production (Gallons) Crude[1]	Synthetic
January	360,822	979,686
February	337,983	690,961
March	366,052	916,872
April	342,307	754,980
May	324,063	897,294
June	298,165	922,551
July	256,136	939,439
August	253,612	951,834
September	260,402	1,079,910
October	297,759	1,309,086
November	309,739	1,789,970
December	319,190	1,301,841
Total (Year)	3,726,230	12,534,424

[1] Refined equivalent would be approximately 82% of the crude production.



CAUSTIC POTASH

FLAKE	SOLID	LIQUID
88/92%	88/92%	45%

CAUSTIC SODA

FLAKE SOLID LIQUID

Uniform, dependable quality . . . unfailingly ! Products of highest standard . . . backed by thorough service . . . yet priced to meet competition.

Write for details and prices

JOSEPH TURNER & Co.
500 Fifth Avenue
New York
SUPPLIERS OF CHEMICALS FOR OVER 70 YEARS

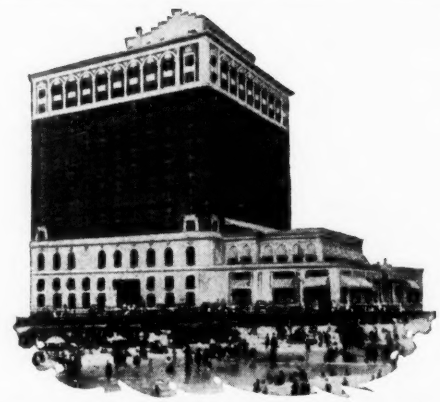
WM. S. GRAY & CO.

342 MADISON AVE.
NEW YORK

VAnderbilt 3-0500 Cable: Graylime

◆

Acetate of Lime
Acetate of Soda
Acetone C. P.
Methanol
(all grades)
Methyl Acetone
Denatured Alcohol
Formaldehyde
Borax
Phenol U. S. P.
Benzol
Toluol
Xylol
Whiting
Magnesium Carbonate
Magnesium Oxide
Sodium Silico Fluoride



Atlantic City's Ideal Convention Hotel on the Boardwalk

Every facility for the perfect handling of your convention or conference combined with an efficient hotel service.

Spacious comfortable lounges . . . dining salons . . . ballrooms . . . sun parlors . . . sun decks . . . excellent cuisine.

Swimming Pool—Salt Water Baths—Golf Tennis—Fishing—Horse Back Riding

For detailed information and special rate plan address the management.

The President

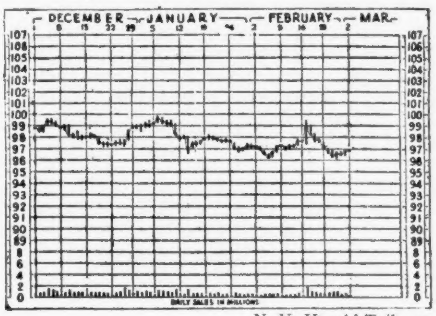
ATLANTIC CITY, NEW JERSEY

Chemical Finances

Stocks Move Lower in Dull Trading—V.-C. Will Not Appeal—'34 Earnings Statements Summarized—

The value of stocks on the N. Y. Stock Exchange tumbled last month, the 2nd consecutive month of losses in '35. The aggregate declined to $32,180,041,075

Daily Record of Stock Market Trend



—N. Y. Herald-Tribune

from $32,991,035,003, a net loss of $810,993,928 as compared with a net loss of $942,847,611 in January, and bringing the total decline to date (Mar. 1) to $1,743,841,539. The rally that followed the announcement of the "Gold Clause" decision by the Supreme Court was short-lived and the market drifted gradually lower throughout the month with the volume extremely small and the public interest at a very low ebb.

Trend in chemical stocks was decidedly mixed in February, the value of the group rising from $3,860,529,000 to $3,899,700,727, a net gain of $39,171,727, as against a net loss of $34,487,123, leaving a net gain so far this year of $4,684,604. The average value on Jan. 1 was $52.57, on Feb. 1, $53.69, and on Mar. 1, $52.65. The average value is a more accurate record of the trend than the comparison of the total values.

Outstanding, of course, in the dividend news of the month, were the 25c extra declared by Commercial Solvents and the increase of Carbide's quarterly to 40c as against 35c paid in the 3 preceding quarters and 25c prior to that.

Other extra dividend declarers include Devoe & Raynolds (25c on class A and class B); Glidden (15c on the common); Clorox Chemical (12½c).

V.-C. Dividend Ruling

V.-C. will not appeal from court ruling (C. I., Feb. p.169) directing management to declare a $7 dividend on each share of prior preference stock outstanding in hands of public.

Execution of the ruling was suspended for 30 days in order that any properly interested party might have reasonable time in which to note appeal to Virginia Supreme Court of Appeals if desired. This period expires about Mar. 15.

President A. L. Ivey, commenting on the matter stated the delay in declaring dividend was not occasioned by any arbitrary refusal or lack of desire on part of directors, but was caused solely by grave doubt on part of majority of the board as to whether or not, under Virginia statutes, they could declare dividend without incurring not only personal liability to themselves, but also to stockholders receiving dividend.

Earnings Statements

Du Pont's net profit from its own operations in '34 was 20% greater than in '33 as against an increase in sales of only 18%, an experience that was contrary to that of the general run of the country's large industrial corporations. Sales in '34 also were 47% greater than in '32 when volume reached the lowest level in any year of the past 5. An increase in tonnage accounts for practically the entire advance in dollar volume last year inasmuch as such changes as occurred in prices of individual products had but slight effect on the average price of the company's products.

Rising trend of business which had carried through, with only temporary setbacks, since the middle of '32, continued until about the middle of last year when sales turned sharply downward, reaching levels lower than the corresponding months of the previous year. In Nov., however, conditions began to improve, sales rising in Dec. to a height which, correcting for seasonal variations, exceeded that of any period during the last 4 years.

'34 Net $3.66 a Share

Net profit in '34 of $46,701,465, or $3.66 a share on the average number outstanding during the year, represented an increase of $7,806,135 over the $38,895,330, or $3 a common share, reported in '33. In '32, when the company's earnings declined to the lowest level in recent years, net amounted to $26,234,778, or $1.82 a common share.

Price Trend of Chemical Company Stocks

	Jan. 31	Feb. 15	Feb. 28	Net gain or loss past month	Price on Feb. 28, 1934	1934-35 High	1934-35 Low
Air Reduction	111	111	112	+1	98½	115¾	91¾
Allied Chemical	136	137½	134	—2	152	160¾	115⅛
Columbian Carbon	69⅝	75¾	74¾	+5⅛	66	77¼	58
Com. Solvents	21⅛	21¼	20⅞	— ¼	27¼	36¾	15¾
du Pont	94¾	95	92¾	—2	98⅞	103⅞	80
Hercules	75¾	.....	75	— ¾	65⅞	81⅝	59
Mathieson	28¼	28⅜	27	—1¼	35½	40¾	23½
Monsanto	56¾	57¾	58⅝	+1⅞	77¾†	61⅝	39
Std. of N. J.	41⅜	40⅝	38	—3⅜	46½	50⅛	38
Texas Gulf S.	34¼	35¼	33¼	—1	38⅛	43¼	30
Union Carbide	46	47¾	46⅞	+ ⅞	44½	50⅞	35⅞
U. S. I.	37*	38½	40	+3	53	64¾	32

* Closing price Jan. 30; † Old stock.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Labs., ext.	25c	Mar. 18	Apr. 1
Abbott Labs.	50c	Mar. 18	Apr. 1
Allied Chem., pf.	$1.75	Mar. 11	Apr. 1
Atlas Powder	50c	Feb. 28	Mar. 11
California Ink	50c	Mar. 22	Apr. 1
Chickasha Cotton Oil, sp.	50c	Mar. 15	Apr. 1
Clorox Chemical, ext.	12½c	Mar. 20	Apr. 1
Clorox Chemical	50c	Mar. 20	Apr. 1
Colgate-Palmolive-Peet, pf.	$1.50	Mar. 5	Apr. 1
Commercial Solvents, ext.	25c	Mar. 6	Mar. 30
Continental Diamond Fibre	15c	Mar. 14	Mar. 29
Devoe & Raynolds A & B, ext.	25c	Mar. 20	Apr. 1
Devoe & Raynolds A & B	25c	Mar. 20	Apr. 1
Devoe & Raynolds 2nd pf.	$1.75	Mar. 20	Apr. 1
du Pont	65c	Feb. 27	Mar. 15
du Pont, deb.	$1.50	Apr. 10	Apr. 25
Eastman Kodak	$1.25	Mar. 5	Apr. 1
Eastman Kodak, pf.	$1.50	Mar. 5	Apr. 1
Flintkote Co.	25c	Mar. 15	Mar. 25
Glidden Co., ext.	15c	Mar. 18	Apr. 1
Glidden Co., pf.	$1.75	Mar. 18	Apr. 1
Glidden Co.	25c	Mar. 18	Apr. 1
Gold Dust. pf.	$1.50	Mar. 16	Mar. 30
Hercules Powder	75c	Mar. 14	Mar. 25
International Salt	37½c	Mar. 15	Apr. 1
International Nickel	15c	Feb. 28	Mar. 30
Koppers Gas & Coke, pf.	$1.50	Mar. 12	Apr. 1
Lindsay Light, pf.	17½c	Mar. 9	Mar. 14
Mathieson Alkali	37½c	Mar. 4	Apr. 1
Mathieson Alkali, pf.	$1.75	Mar. 4	Apr. 1
Monsanto Chemical	25c	Feb. 25	Mar. 15
National Lead	$1.25	Mar. 15	Mar. 30
National Lead, pf. A	$1.75	Mar. 1	Mar. 15
National Lead, pf. B	$1.50	Apr. 19	May 1
Penick & Ford	75c	Mar. 1	Mar. 15
Pittsburgh Plate Glass	50c	Mar. 9	Apr. 1
Procter & Gamble, pf.	$1.25	Feb. 25	Mar. 15
Sherwin Williams, Ltd., pf.	$1.75	Mar. 15	Apr. 1
Spencer Kellogg	40c	Mar. 15	Mar. 30
St. Joseph Lead	10c	Mar. 8	Mar. 20
Texas Gulf Sulphur	50c	Mar. 4	Mar. 15
Union Carbide	40c	Mar. 8	Apr. 1
United Dyewood, pf.	$1.75	Mar. 14	Apr. 1
U. S. I.	50c	Mar. 15	Mar. 30
Westvaco Chlorine, pf.	$1.75	Mar. 15	Apr. 1

ANNUAL MEETINGS

	Record Date	Date of Meeting
Atlas Powder	Feb. 26	Mar. 19
Commercial Solvents	Feb. 20	Mar. 21
Corn Products	Mar. 5	Mar. 26
du Pont	Feb. 15	Mar. 11
Eastman Kodak	Mar. 30	Apr. 30
Freeport Texas	Feb. 15	Mar. 11
Hercules Powder	Feb. 26	Mar. 19
Mathieson Alkali	Mar. 4	Mar. 26
Penick & Ford	Mar. 6	Mar. 26
St. Joseph Lead	Mar. 8	Mar. 14
United Carbon	Feb. 13	Mar. 5

Solvents Net $2,346,237

Commercial Solvents and subsidiaries for year ended Dec. 31, certified by independent auditors, shows consolidated net profit of $2,346,237 after charges, federal taxes and depreciation, equivalent to 89c a share on 2,636,042 no-par shares of stock outstanding at end of year. In preceding year (including Rossville Comm. Alco. Corp. and American Solvent & Chemical Corp. of California, from date of acquisition, Aug. 1, '33) consolidated net profit was $2,327,846, equal to 88c a share on 2,635,811 shares.

For quarter ended Dec. 31, '34, net profit was $495,743 after federal taxes, etc., equal to 19c a share. This compares with $612,756, or 23c a share, in preceding quarter and $1,048,480, or 40c a share, in Dec. quarter of '33.

Mathieson, Monsanto Reports

Mathieson Alkali, for year ended Dec. 31, '34, shows net income of $1,165,836 after depreciation, depletion, obsolescence and federal taxes, equivalent after dividend requirements on 7% preferred stock, to $1.20 a share on 830,714 no par shares of common outstanding at close of the year. This compares with net income in '33 of $1,224,078 equal to $1.70 a share on 623,263 common shares then outstanding.

Total earnings of Monsanto Chemical for '34, including its proportion of the undivided profits of controlled companies not consolidated, and uncontrolled companies, were $2,771,629.29 or $3.20½ a share on the 864,000 shares outstanding, according to Edgar M. Queeny, president. Of the total earnings, $2,638,040.17 or $3.05 a share resulted from operations of the parent and wholly owned subsidiary companies. Earnings for '33, after giving effect to the 100% stock distribution of last April, amounted to $2.57 a share.

Freeport's Operations

Report of Freeport Texas and wholly-owned subsidiaries for year ended Dec. 31, 1934, certified by independent auditors, shows net income of $1,477,089 after depreciation, federal taxes, etc., equivalent after deducting $77,173 dividends paid on 6% preferred stock, to $1.76 a share (par $10) on average number of common shares outstanding during the year. Based on 796,380 common shares outstanding at close of year, net income is equal after preferred dividends, to $1.75 a share. This compares with net income in '33, of $2,478,839, equal to $3.14 a share on average common shares outstanding during the year, and $3.01 a share on 784,663 common shares outstanding at end of that year.

L. M. Williams, Jr., president, states, "Earnings for '34 were less than for '33 by reason of a decline in sales and an increase in production costs. While conditions at Grande Ecaille, the company's new sulfur deposit in Louisiana, have caused disappointing delays in obtaining satisfactory costs, it might be well to call attention again to the fact that similar conditions were encountered at the company's other 2 properties. In each case the methods which have been followed since last Spring at Grande Ecaille ultimately secured satisfactory results."

Announcement is made of an agreement with The Texas Co. which provides that this company will commence a drilling program early in 1935 in an effort to secure oil production at Freeport's properties at Bryanmound, Tex.

United Carbon Report

Pamphlet report of United Carbon and subsidiaries for year ended Dec. 31, '34, certified by independent auditors, shows current assets, including $1,189,605 cash, amounted to $2,996,711 at close of the year, and current liabilities were $828,679. This compares with cash of $667,759, current assets of $3,442,553 and current liabilities of $536,594 at end of '33.

Westvaco Earns $595,997

Report of Westvaco Chlorine Products and subsidiaries for year ended Dec. 29, certified by independent auditors, shows net profit of $595,997 after depreciation, interest, federal taxes, etc., equivalent ater 7% preferred dividend requirements, to $1.55 a share on 284,962 no-par shares of common stock. This compares with $463,164 or $1.08 a common share in year ended Dec. 30, '33.

Molybdenum Earnings

With Molybdenum Corp. of America expecting its '35 business to at least equal that for '34, barring unforeseen development, the management intends to recommend initiation of dividend payments as soon as it is assured that earnings will continue on the present basis, Marx Hirsch, president, states.

Additional Statements

Report of Chickasha Cotton Oil and its wholly-owned subsidiary, Guymon Investment, for 6 months ended Dec. 31, subject to year-end adjustments, shows net income of $403,442 after depreciation, interest, federal taxes, etc., equivalent to $1.58 a share on 255,000 shares (par $10) of capital stock.

Report of New Jersey Zinc for year ended Dec. 31, shows net income of $3,788,380 after taxes, depreciation, depletion, contingencies, etc., equivalent to $1.93 a share (par $25) on 1,963,264 shares of capital stock. This compares with $3,994,072 or $2.03 a share in '33.

Monthly record of U. S. '34 commercial failures, as published in the Survey of Current Business, Feb., '35, shows that failures under the sub-division "chemicals, drugs and paints," under the major heading of "manufacturers," constituted the smallest of the 9 groups.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1934	Net income 1933	Common share earnings 1934	Common share earnings 1933	Surplus after dividends 1934	Surplus after dividends 1933
Chickasha Cotton Oil:							
Six months, Dec. 31	z$ .50	$ 403,442	....	$1.58	....	......	....
Commercial Solvents:							
Dec. 31 quarter	§.60	495,743	$1,048,480	$ .19	$ .40	......	....
Year, Dec. 31	§.60	2,346,237	2,327,846	.89	.88	$ 764,645	$ 778,001
du Pont de Nemours & Co., E. I.:							
Year, Dec. 31	§2.60	46,701,465	38,895,330	j3.66	j3.00	5,892,551	2,104,712
International Salt Co.:							
Year, Dec. 31	1.50	470,368	490,709	1.96	2.04	120,189	140,069
Mathieson Alkali Works, Inc.:							
Year, Dec. 31	1.50	1,165,836	1,224,078	h1.20	h1.70	d154,623	122,213
Molybdenum Corp. of Amer.:							
Year, Dec. 31	f....	302,699	104,562	h .52	h .20	......	....
Monsanto Chemical Co.:							
Year, Dec. 31	§1.00	2,771,629	2,221,207	3.20	2.57	......	....
National Lead Co.:							
Year, Dec. 31	§5.00	4,200,188	3,828,329	8.37	j6.98	916,548	537,140
New Jersey Zinc Co.:							
Dec. 31 quarter	2.00	955,231	1,108,783	.49	.56	d138,148	67,544
Year, Dec. 31	2.00	3,788,380	3,994,072	1.92	2.03	d26,401	127,151
Penick & Ford, Ltd., Inc.:							
Year, Dec. 31	§3.00	1,405,514	1,443,647	3.80	3.70	265,514	270,321
Young Co., J. S.:							
Year, Dec. 31	6.00	185,601	160,936	9.11	7.36	45,653	19,870
United Carbon Co.:							
Year, Dec. 31	2.40	1,452,939	636,217	3.55	....	......	....

z Last dividend declared; § Plus extras; *j* On average shares; † No common dividend; *h* On shares outstanding at close of respective periods; *d* Deficit.

Annual Financial Statements

Company:	Fixed chgs. times earn.	Pfd. div. times earned	Cash and mark. securities	Inventories	Ratio cur. assets to cur. liab.	Working capital
du Pont de Nemours, E. I., & Co.:						
Year, Dec. 31, 1934 ..	d....	7.12	c$61,695,842	$43,669,984	6.5	c$104,870,096
Year, Dec. 31, 1933 ..	d....	5.94	c76,848,927	33,835,935	7.8	c113,169,797
Mathieson Alkali Works, Inc.:						
Year, Dec. 31, 1934 ..	No fd. dbt.	7.00	†842,652	1,626,832	2.2	1,767,061
Year, Dec. 31, 1933 ..	No fd. dbt.	7.33	†1,119,310	1,383,067	4.1	2,465,898

d Company has no direct funded debt; † Cash only; *c* Exclusive of investment in General Motors Corp.

Chemical Stocks and Bonds

1935 February Last	1935 February High	1935 February Low	1934 High	1934 Low	1933 High	1933 Low	Sales (Number of shares) February 1935	Sales (Number of shares) 1935	Stocks	Par $	Shares Listed	An. Rate*	Earnings $-per share-$ 1934	Earnings $-per share-$ 1933
NEW YORK STOCK EXCHANGE														
112	115¾	109½	113	91¾	112	47½	6,700	17,800	Air Reduction	No	841,288	$4.50	.....	3.79
134	141	132¾	160¾	115⅛	152	70¾	10,800	23,700	Allied Chem. & Dye	No	2,214,099	6.00	.....	5.50
127½	127½	123¾	130	122⅛	125	115	1,900	2,900	7% cum. pf.	100	345,540	7.00	.....	42.24
53	57¾	47½	48	25¼	35	7¼	5,400	31,200	Amer. Agric. Chem.	100	315,701	2.00	.....	*p*4.19
26½	33¼	25½	62½	20¾	89⅞	13	15,500	36,600	Amer. Com. Alcohol	20	260,716	None	.....	4.56
39⅞	40½	36	39⅛	26¼	29¼	9¾	7,900	18,000	Archer-Dan-Midland	No	541,546	1.50	.....	*p*3.82
39⅞	43	37½	55½	35¼	39⅛	9	4,700	8,400	Atlas Powder Co.	No	234,235	2.00	2.49	.74
110	110	106¾	106¾	83	83⅛	60	440	800	6% cum. pfd.	100	88,781	6.00	13.54	8.38
28⅞	35⅜	28⅝	44⅞	17⅛	58⅞	4½	59,800	138,600	Celanese Corp. Amer.	No	987,800	None	.....	3.32
17¼	18¼	16⅛	18⅛	9½	22⅜	7	32,900	69,000	Colgate-Palm.-Peet	No	1,985,812	.75	.....	— .57
103	103	101	102½	68½	88	49	2,400	5,900	6% pfd.	100	254,500	6.00	.....	1.51
79¾	79¾	67	77¼	58	71½	23⅛	17,200	30,500	Columbian Carbon	No	538,154	3.40	.....	2.17
20⅞	23⅞	19¼	36¾	15¾	57¼	9	96,900	260,300	Commer. Solvents	No	2,635,371	.85	.89	.88
64½	68	62	84½	55½	90⅝	45⅜	18,800	37,800	Corn Products	25	2,530,000	3.00	.....	3.87
154	154	149	150½	135	145¾	117½	1,200	2,000	7% cum. pfd.	100	243,739	7.00	.....	46.02
42	50⅜	38¾	55¼	29	33⅞	10	1,000	3,600	Devoe & Rayn. A	No	95,000	2.00	.....	3.82
92¾	99½	91⅞	103⅞	80	95⅞	32⅛	52,000	111,200	DuPont de Nemours	20	10,871,997	3.15	.....	2.93
128½	129	126⅞	128½	115	117	97½	4,600	6,900	6% cum. deb.	100	1,092,699	6.00	.....	35.58
120⅞	123⅛	110½	116½	79	89¾	46	14,300	31,000	Eastman Kodak	No	2,250,921	4.00	.....	4.76
147	147	141	147	120	130	110	640	1,450	6% cum. pfd.	100	61,657	6.00	.....	180.34
21	26	20⅜	50⅜	21½	49⅜	16⅛	15,200	31,700	Freeport Texas	10	784,664	2.00	1.76	3.01
120	120	117	160⅛	113½	160⅛	97	300	600	6% conv. pfd.	100	25,000	6.00	120.08	156.73
26½	27⅞	23⅜	28⅜	15⅝	20	3¾	22,500	44,400	Glidden Co.	No	603,304	.90	.....	1.54
106⅞	108	104⅞	107½	83	91½	48	630	1,420	Glidden, 6% pfd.	100	63,044	7.00	.....	22.60
94¼	94½	85	96⅞	74	85⅞	65	4,200	9,000	Hazel Atlas	25	434,409	5.00	.....	6.22
75	77⅝	73¼	81⅝	59	68⅝	15	3,200	9,100	Hercules Powder	No	582,679	3.00	3.94	2.79
122	125	122	125¾	111	110⅛	85	850	1,030	7% cum. pfd.	100	105,765	7.00	28.79	22.38
31¼	33	30¼	32	19⅜	85	24	45,200	111,300	Industrial Rayon	No	600,000	1.68	2.23	3.01
3¾	5	3⅝	6⅛	2	5⅞	⅞	8,600	26,500	Intern. Agricul.	No	436,049	None	.....	*p* .69
36¼	42¾	33½	37¼	15	23½	5	2,400	12,400	7% cum. pr. pfd.	100	100,000	None	.....	*p*4.00
23½	24½	22¼	29¼	21	23¼	6¾	92,500	205,700	Intern. Nickel	No	14,584,025	.60	.....	.53
30	31⅛	29	32	21	27¾	13¾	1,200	3,000	Intern. Salt	No	240,000	1.50	2.02	2.04
35	36	33	33⅛	15¾	22	7½	5,100	10,500	Kellogg (Spencer)	No	500,000	1.60	.....	*v*3.01
27	32¾	26½	43⅞	22½	37⅜	4⅜	33,800	99,900	Libbey Owens Ford	No	2,559,042	1.20	1.25	1.64
27	30⅞	25¼	35⅜	16⅛	50	10¼	6,400	26,100	Liquid Carbonic	No	342,406	1.25	.....	*v*1.05
27	32	26⅛	40¾	23½	46⅝	14	18,600	51,700	Mathieson Alkali	No	650,436	1.50	1.20	1.70
58⅝	60½	55	61⅝	39	83	25	10,700	23,300	Monsanto Chem.	10	864,000	1.25	.....	2.57
165	168½	145	170	135	140	43¼	1,900	3,200	National Lead	100	309,831	5.00	8.38	6.98
155	155	150	146½	122	128¼	101	140	540	7% cum. "A" pfd	100	243,676	7.00	20.12	18.35
123	125	121⅝	121½	100½	109⅛	75	120	710	6% cum. "B" pfd.	100	103,277	6.00	35.36	30.45
6	8	5⅝	13	5½	11¾	1⅜	5,300	13,700	Newport Industries	1	519,347	None	.....	.05
89⅝	90¾	83⅞	94	60	96¾	31½	7,500	18,400	Owens-Illinois Glass	25	1,200,000	4.00	.....	4.86
49¼	49¼	42⅜	44⅜	33⅛	47½	19⅝	37,500	68,700	Procter & Gamble	No	6,410,000	1.70	.....	*p* 2.11
117	117	115	117	102½	110¾	97	440	1,110	5% pfd. (ser. 2-1-29)	100	171,569	5.00	....	*p*73.15
4⅝	5½	4⅜	6¾	3⅛	7¼	1⅜	6,100	17,700	Tenn. Corp.	5	857,896	None	.....	— .11
33¼	36¾	33	43¼	30	45¼	15¼	33,300	61,400	Texas Gulf Sulphur	No	2,540,000	2.00	.....	2.93
46⅞	49	44	50⅞	35⅞	51⅞	19¾	62,600	130,000	Union Carbide & Carbon	No	9,000,743	1.60	.....	1.59
53	53	46	50⅜	35	37¾	10¼	23,500	35,800	United Carbon	No	370,127	2.40	3.55	1.39
40	45½	36¼	64¾	32	94	13½	11,100	30,500	U. S. Indus. Alco.	No	391,033	None	.....	3.56
16¼	21¾	16	31¾	14	36¼	7⅝	10,900	33,300	Vanadium Corp.-Amer.	No	366,637	None	.....	—2.40
3½	4⅝	3½	5⅜	1⅞	7⅜	⅝	6,700	26,200	Virginia-Caro. Chem.	No	486,000	None	.....	*p*—2.46
24	27¼	20½	26	10	26½	3⅜	9,900	45,200	6% cum. part. pfd.	100	213,392	None	.....	*p* .52
98½	100	85	84	59¾	63½	35⅜	700	2,500	7% cum. prior pfd.	100	60,000	None	.....	*p*9.06
19⅞	23½	18½	27¼	14⅞	20½	5	3,800	14,700	Westvaco Chlorine	No	284,962	.40	1.55	1.08
NEW YORK CURB EXCHANGE														
16⅝	17⅞	15¾	22½	14⅝	16½	3¼	39,900	97,400	Amer. Cyanamid "B"	No	2,404,194	*m* .10	.....	.99
2½	3⅛	2⅞	4⅛	2⅜	4½	1	800	2,200	British Celanese Am. R.C.R.	243	....	None	.....	.....
109	110	102¾	105¼	81	110	27	3,850	9,175	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	.....	32.24
105	105	102	102	83	90	51	825	1,900	7% cum. prior pfd.	100	113,668	7.00	.....	47.98
12	15	12	19	7	26⅞	2	550	2,650	Celluloid Corp.	15	194,952	None	.....	—1.00
11⅞	12⅜	11¾	14⅜	10½	11⅝	4⅛	3,900	4,500	Courtaulds' Ltd.	1 £	24,000,000	4½%	.....	.....
87	92	84	91	67½	78	30	4,200	12,300	Dow Chemical	No	945,000	2.00	.....	†3.60
8⅞	11	8¾	10¾	4	8	½	4,600	10,000	Duval Texas Sulphur	No	500,000	None	.....	*z* .08
39	42	37	40¾	19	19	8	1,600	3,800	Heyden Chem. Corp.	10	147,600	1.35	.....	2.68
52	58	53½	57½	39	39⅞	13	4,850	15,950	Pittsburgh Plate Glass	25	2,141,305	1.40	.....	1.87
87½	90¼	84	90½	47¼	47	12⅞	7,575	16,675	Sherwin Williams	25	635,583	3.00	.....	*y*3.54
111	111	108	109¾	100	99	80	180	410	6% pfd. AA. cum.	100	155,521	6.00	.....	*y*20.78
CLEVELAND STOCK EXCHANGE														
87	92	84	91	67½	78	30	250	850	Dow Chemical	No	945,000	2.00	.....	†3.60
PHILADELPHIA STOCK EXCHANGE														
74	79	73⅞	75	50¼	57	25¼	150	350	Pennsylvania Salt	50	150,000	3.00	.....	2.17

1935 February Last	1935 February High	1935 February Low	1934 High	1934 Low	1933 High	1933 Low	Sales February 1935	Sales 1935	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
107⅛	107½	105⅛	106¾	83⅞	89	64	381,000	829,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
8¾	11	8¾	17¾	5	14⅛	2⅛	61,000	231,000	Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
84¾	87½	77⅜	88	61½	74⅞	37	62,000	190,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
99¼	99¾	91⅛	92	62	65	38½	193,000	419,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
8	10⅜	7¾	19½	5⅛	14⅞	2½	209,000	568,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
90½	93½	89¼	98½	89⅞	99⅛	87	28,000	204,000	Montecatini Min & Agric. det. 7's with war.	1937	7	J. J.	7,075,045
38	...	...	74½	34½	62	33¾	1,000	7,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
95	95	91½	90	65½	76	50	41,000	72,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
92	94¼	88½	89½	62	81	34¾	195,000	574,000	Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000
NEW YORK CURB EXCHANGE													
103¾	104	102⅛	104⅝	101⅜	103½	101	19,000	54,000	Westvaco Chlorine Prod. 5½'s	1937	5½	M. S.	1,393,000

† Year ended 5-31-34; *m* Last paid, no regular rate; *p* Year ended 6-30-34; *v* Year ended 9-1-34; *y* Year ended 8-31-34; *z* Year ended 8-31-34;
* Including extras.

Industrial Trends

¶ *Advance In Business Is Halted, But February Volume Is Satisfactory—Outlook Less Favorable*

Business leveled off in February and the consensus of opinion is that the spring peak has been reached. While the upward swing of the past months appeared to be about ended the volume of business and the rate of manufacturing activity in February did not prove disappointing. While some lines showed recessions, others reported further advances.

Retail trade remains 10 to 15% ahead of last year. Spotty weather temporarily slowed up sales in some sections but retail outlets are expecting the best spring season in 5 years. This confidence is reflected in the state of wholesale trade.

Steel activity declined slightly in the past month from 52.5% to 47.9%. At the close of February a year ago the rate was 45.7% and rising, due to the late start in the automotive centers. However, it is expected that steel demand will hold at fairly satisfactory levels at least through March. Automobile production still remains heavy. February figure was about 350,000 units and preliminary estimates for March now run close to 425,000 units. The possibility of a strike in the Detroit area is very remote. Carloadings continue to fluctuate when compared with figures of a year ago. In the first 2 weeks of the month the total was greater, but then the trend reversed itself. Gains in electrical consumption are encouraging, running between 6 and 7%.

Changes in the *N. Y. Times* Index of Business Activity were small, the index for the week ending Feb. 23 being 0.7 above the rate for the week of Jan. 26 but 0.4 under the peak week of Feb. 9. Lumber output remains ahead of last year; so do the coal production figures. Crude oil totals, while dropping, are still ahead of the Federal allowable.

Building, despite the efforts of the Government agencies designed to stimulate it, remains at a very low ebb if the PWA projects are segregated from the total. Nevertheless, the stimulus of the modernization program is being felt in the production schedules in the paint and varnish fields, also in the flat glass industry. The paint producers are now at the seasonal peak of manufacturing, but further advances are more than likely if building and repairs show worthwhile improvement. Tanning and shoe manufacturing are again at satisfactory levels. The situation in textiles is a mixed one, rayon and silk are in heavy demand, but the manufacture of cotton cloth is fluctuating within rather wide limits. The splendid showing in the automotive field is reflected in the call for tires and the Akron area is a busy one.

Within the final week of the month a certain amount of bearish feeling again became quite evident. Most of this is the result of the rather pessimistic picture that comes out of Washington. Business improved considerably once the so-called gold clause decision was announced, but this optimistic feeling was toned down noticeably by the dead-lock between the President and Congress on the question of paying "prevailing wage rates" on projects designed to take care of the unemployed. If the wishes of Senator Wagner and the labor leaders finally prevail it means even greater expenditures than those suggested by the President and will be looked upon in most circles as just another step along the road of inflation.

Commodity markets reflected the feeling of uncertainty, the trend being mixed. In the attached statistics 2 of the wholesale price indices show advances, while the other 2 show declines. Tin and shellac were unsettled and lower, most of the oils and fats, on the other hand, were up sharply.

With the majority of the consuming industries operating at fairly high levels the call for industrial chemicals last month was satisfactory. With the mixing season at its height the fertilizer materials suppliers are experiencing the best year they have had since '31. Although in certain sections the cold weather continued to retard mixers somewhat. Plating chemicals are moving out in large quantities.

All indications point to March chemical tonnage equaling or even bettering that of February. March is usually one of the 2 best months of the year in the chemical field and some tapering off is expected in April. The price structure, generally speaking, is one of firmness and few changes are anticipated at the close of the first quarter of the year. It is expected that the tonnage gain during this period will amount to 10% above the first quarter of '34.

Statistics of Business

	January 1935	January 1934	December 1934	December 1933	November 1934	November 1933
Auto production	292,765	156,907	185,919	80,565	78,415	60,683
Bldg. contracts*‡	$99,773	$186,463	$212,813	$278,030	$111,740	$162,340
Failures, Dun & Bradstreet	1,184	1,364	963	1,132	923	......
Merchandise imports‡	......	......	$132,252	$133,518	$150,519	$128,541
Merchandise exports‡	......	......	$170,676	$192,638	$194,901	$184,256
Newsprint Production						
Canada, tons	201,959	188,374	239,544	175,304	240,869	193,718
U. S., tons	80,666	84,194	79,777	80,895	74,933	87,567
Newfoundland, tons	28,012	25,477	24,394	......	28,713	......
Total, tons	312,703	299,278	345,535	......	346,271	......
Plate Glass prod., sq. ft.	13,365,188	1,607,195	8,389,975	......	6,587,366	4,169,442
Shoe production, pairs	......	26,041,782	23,199,708	......	23,852,174	23,695,000
Steel ingots	2,576,671	1,971,187	1,941,000	1,798,000	1,579,356	1,487,968
Steel activity, % of capacity	47.67	33.16	35.26	33.10	27.76	......
U. S. consumption crude rubber, tons	47,103	39,284	36,662	28,757	34,842	......
Tire shipments	......	......	3,108,552	3,531,121	3,191,102	2,197,485
Tire production	......	......	3,778,418	3,081,886	3,340,859	3,039,386
Tire inventory	......	......	9,454,985	8,888,070	8,778,989	9,246,563
Dept. of Labor Indices						
Factory payrolls, totals†	64.1	63.2	64.0	54.3	59.51	55.5
Factory employment†	80.4	75.1	78.1	74.4	76.7	75.9
Chemical price index†	......	78.8	82.2	79.2	80.9	79.2
Chemical employment†*a*	......	107.9	108.7	107.6	107.9	108.4
Chemical payrolls†*a*	......	84.5	91.7	84.9	90.9	84.6
Chemicals and Related Products						
Exports‡	......	......	$8,478	......	......	......
Imports‡	......	......	$4,437	......	......	......
Stocks, mfd. goods†	......	126	117	121	113	......
Stocks, raw materials†	......	117	117	126	121	......

Week Ending	Carloadings 1935	Carloadings 1934	Carloadings % of Change	Electrical Output§ 1935	Electrical Output§ 1934	Electrical Output§ % of Change	Jour. of Com. Price Index	National Fertilizer Association Indices Metals	Fats & Oils	Chem. & Drugs	Mixed Fert.	Fert. Mat.	All Groups	Labor Dept. Chem. & Drug Price Index	% Steel Activity	Fisher's Index Purch. Power	N. Y. Times Index Bus. Act.
Jan. 26	555,768	563,100	—1.3	1,781,666	1,610,542	+10.6	79.9	81.9	80.0	94.0	76.5	65.8	77.6	80.0	52.5	122.6	86.8
Feb. 2	598,164	565,401	+5.8	1,762,671	1,636,275	+7.7	79.7	81.8	82.5	94.0	76.5	65.8	77.7	80.2	52.8	122.6	88.3
Feb. 9	592,560	573,898	+3.3	1,763,696	1,651,535	+6.8	79.9	81.8	83.0	94.0	76.5	65.8	77.9	80.4	50.8	122.3	87.9
Feb. 16	581,981	600,268	—3.0	1,760,562	1,640,951	+7.3	80.2	81.7	84.4	94.0	76.1	65.8	78.2	80.4	49.1	121.4	87.1
Feb. 23	552,896	574,908	—3.8	....	1,646,465	....	79.1	81.7	84.7	94.0	76.1	65.7	78.3	81.0	47.9	121.7	87.5
Mar. 2	......	......	....	....	....	....	79.7	81.6	82.2	94.0	76.1	65.5	77.9	...	...	122.0	...

* 37 states, F. W. Dodge Corp.; ‡ 000 omitted; † Dept. of Labor, 3 year average, 1923-1925 = 100.0; *a* Includes all allied products but not petroleum refining; § k.w.h., 000 omitted.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizers and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1934 Average $1.31. - Jan. 1934 $1.37 - Feb. 1935 $1.22

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Acetaldehyde, drs c-l, wks lb.	...	.14	...	.14	.14	.16½
Acetaldol, 95%, 50 gal drs wks lb.	.21	.25	.21	.25	.21	.31
Acetamide, tech, lcl, kegs lb.	.38	.43	.38	.43	.40	1.35
Acetanalid, tech, 150 lb bbls lb.	.24	.26	.24	.26	.24	.26
Acetic Anhydride, 100 lb cbys lb.	.21	.25	.21	.25	.21	.25
Acetin, tech, drs lb.	.22	.24	.22	.24	.22	.32
Acetone, tks, delv lb.	.11	.12	.11	.12	.10	.12
drs, c-l, delv lb.	...	.12	...	.12	.12	.12
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls lb.	.06¾	.07	.06¾	.07	.06	.07
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.	...	2.40	...	2.40	2.40	2.91
glacial, bbls, c-l, wks 100 lbs.	...	8.25	...	8.25	8.25	10.02
glacial, USP, bbls, c-l, wks 100 lbs.	...	12.25	...	12.25	...	12.25
Adipic, kgs, bbls lb.	...	.72	...	.72	.72	.72
Anthranilic, refd, bbls lb.	.85	.95	.85	.95	.85	.95
tech, bbls lb.	...	.75	...	.75	.65	.75
Battery, cbys, delv 100 lbs.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb kgs lb.	.40	.45	.40	.45	.40	.45
USP, 100 lb kgs lb.	.54	.59	.54	.59	...	...
Boric, tech, gran, 80 tons, bgs, delv ton *a*	...	80.00	...	80.00	80.00	80.00
ton *a*	...	90.00	...	90.00	90.00	90.00
ton *a*	...	85.00	...	85.00	85.00	85.00
ton *a*	...	95.00	...	95.00	95.00	95.00
Broenner's, bbls lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 95%, cbys lb.	.53	.60	.53	.60	.53	.85
edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs lb.	...	.22	...	.22	.22	.22
wks lb.	...	.23	...	.23	.23	.23
tks, wks lb.	...	.21	...	.21	.21	.21
Camphoric, drs lb.	...	5.25	...	5.25	5.25	5.25
Chicago, bbls. lb.	...	2.10	...	2.10	2.10	2.10
Chlorosulfonic, 1500 lb drs, wks lb.	.04½	.05½	.04½	.05½	.04½	.05½
Chromic, 99¾%, drs, delv lb.	.13¾	.15¾	.13¾	.15¾	.13½	.15¾
Citric, USP, crys, 230 lb bbls lb. *b*	.28	.29	.28	.29	.28	.30
anhyd, gran, drs lb. *b*	...	.31	...	.31	.31	.31
Cleve's, 250 lb bbls lb.	.52	.54	.52	.54	.52	.54
Cresylic, 99%, straw, HB, drs, wks, frt equal gal.	.46	.47	.46	.47	.46	.47
99%, straw, LB, drs, wks, frt equal gal.	.64	.65	.64	.65	.64	.65
resin grade, drs, wks, frt equal gal.	.54	.55	.54	.55	.54	.55
Crotonic, drs lb.	.90	1.00	.90	1.00	.90	1.00
Formic, tech, 140 lb drs lb.	.11	.13	.11	.13	.11	.13
Fuming, see Sulfuric (Oleum)						
Fuoric, tech, 90%, 100 lb. drs. lb.	...	.35	...	.35	...	.35
Gallic, tech, bbls lb.	.65	.68	.65	.68	.60	.70
USP, bbls lb.	.70	.80	.70	.80	.74	.80
Gamma, 225 lb bbls, wks lb.	.77	.79	.77	.79	.77	.79
H, 225 lb. bbls, wks lb.	.50	.55	.50	.55	.50	.70
Hydriodic, USP, 10% sol. cbys lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 48% com 155 lb cbys, wks lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, see muriatic.						
Hydrocyanic, cyl, wks lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.11	.12	.11	.12	.11	.12
Lactic, 22%, dark, 500 lb bbls lb.	.04½	.05	.04½	.05	.04	.05
22%, light refd, bbls lb.	.06½	.07	.06½	.07	.06½	.07
44%, light, 500 lb bbls lb.	.11½	.12	.11½	.12	.11½	.12
44%, dark, 500 lb bbls lb.	.09½	.10	.09½	.10	.09	.10
USP X, 95%, cbys lb.	.45	.50	.45	.50	...	...
USP VIII, 75%, cbys lb.	.43	.48	.43	.48	...	...
Laurent's, 250 lb bbls lb.	.36	.37	.36	.37	.36	.37
Linoleic, bbls lb.	.16	.16	.16	.16	.16	.16
Maleic, powd, kgs lb.	.29	.32	.29	.32	.25	.32
Malic, powd, kgs lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.01
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls lb.	1.50	1.60	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.35	...	1.35	...	1.35
tks, wks 100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks 100 lb.	...	1.45	...	1.45	...	1.45
tks, wks 100 lb.	...	1.20	...	1.20	...	1.20
22°, c-l, cbys, wks 100 lb.	...	1.95	...	1.95	...	1.95
tks, wks 100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85	.87
Naphthenic, drs lb.	.12	.13	.12	.13	.10	.13
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys. c-l, wks 100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N. Y. lb.	.11½	.12½	.11½	.12½	.11½	.12⅛
Phosphoric, 50%, USP, cbys lb.	.14	.14	.14	.14	.14	.14
50%, acid, c-l, drs, wks lb.	.06	.08	.06	.08	.05	.08
75%, acid, c-l, drs, wks lb.	.09	.10½	.09	.10½	.07	.10½
Picramic, 300 lb bbls, wks lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks lb.	.30	.40	.30	.40	.30	.50
Pyrogallic, crys, kgs, wks lb.	1.55	1.65	1.55	1.65	1.40	1.65
Salicylic, tech, 125 lb bbls, wks lb.	...	.40	...	.40	.33	.40
Sebacic, tech, drs, wks lb.	...	.58	...	.58	...	.58
Sulfanilic, 250 lb bbls, wks lb.	.18	.19	.18	.19	.18	.19
Sulfuric, 60°, tks, wks ton	...	11.00	...	11.00	...	11.00
c-l, cbys, wks 100 lb.	...	1.10	...	1.10	...	1.10
66°, tks, wks ton	...	15.50	...	15.50	15.00	15.50
c-l, cbys, wks 100 lb.	...	1.35	...	1.35	...	1.35
CP, cbys, wks lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran powd, 300 lb bbls lb.	...	.24	.24	.25	.25	.26
Tobias, 250 lb bbls lb.	.75	.80	.75	.80	.75	.80
Trichloroacetic bottles lb.	2.45	2.75	2.45	2.75	2.00	2.75
kgs lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls lb.	1.50	1.60	1.50	1.60	1.35	1.70
Vanadic, drs, wks lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls lb.	.45	.53	.45	.53	.35	.53
dark, bbls lb.	.12	.17	.12	.17	.10	.17
egg, edible lb.	.85	.87	.85	.87	.82	.92
vegetable, edible lb.	.65	.70	.65	.70	.65	.70
ALCOHOLS						
Alcohol, Amyl, tks, delv lb.	...	.143	...	.143	...	.143
c-l, drs, delv lb.	...	.15	...	.15	.15	.157
Amyl, secondary, tks, delv lb.	...	.108	...	.108	...	.108
c-l, drs, delv lb.	...	.118	...	.118	...	.118
Amyl, tertiary, taks, delv lb	...	.052	...	.052	...	.052
c-l, drs, delv lb.	...	.062	...	.062	...	.062
Benzyl, bottles lb.	.75	1.10	.75	1.10	.75	1.10
Butyl, normal, tks, delv lb. *d*	...	.12	...	.12	.09½	.12
c-l, drs, delv lb. *d*	...	.13	...	.13	.10½	.13
Butyl, secondary, tks, delv lb. *d*	...	.096	...	.096	.076	.096
c-l, drs, delv lb. *d*	...	.106	...	.106	.086	1.06
Capryl, drs, tech, wks lb.	...	.85	...	.85	.85	.85
Cinnamic, bottles lb.	3.25	3.65	3.25	3.65	3.25	3.65
Denatured, No. 5, c-l, drs, wks gal. *e*	...	.34	...	.34	.30	.34
Western schedule, c-l, wks gal. *e*	...	.38	...	.38	...	...
Denatured, No. 1, tks, wks gal. *e*	...	.29½	...	.29½	.29½	.304
c-l, drs, wks gal. *e*	...	.34½	...	.34½	...	...
Western schedule, tks, wks gal. *e*	...	.32½	...	.32½	...	...
c-l, drs, wks gal. *e*	...	.37½	...	.37½	...	...
Diacetone, tech, tks, delv lb. *f*	...	.16	...	.16	...	...
c-l, drs, delv lb. *f*	...	.17	...	.17	...	.17

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices Current

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Alcohols (continued)						
Ethyl, 190 proof, molasses,						
tks ... gal. *g*	...	4.08½	...	4.08½	...	4.08½
c-l, drs ... gal. *g*	...	4.13½	...	4.13½	...	4.13½
c-l, bbls ... gal. *g*	...	4.15½	...	4.15½	4.12½	4.24½
absolute, drs ... gal. *g*	4.55½	6.10	4.55½	6.10	...	...
Furfuryl, tech, 500 lb,						
drs ... lb.	...	.35	...	.35	.35	.40
Hexyl, tks, delv ... lb.	...	.11½	...	.11½	...	.11½
c-l, drs, delv ... lb.	...	.12½	...	.12½	...	.12½
Isoamyl, prim, cans, wks lb.	4.00	4.50	4.00	4.50	4.00	4.50
Isobutyl, refd, lcl, drs ... lb.	...	.12	.12	.60	.60	.75
c-l, drs ... lb.	...	.11½	...	...	...	...
tks ... lb.	...	.10½	...	...	...	...
Isopropyl, refd, c-l, drs ... lb.	...	.55	...	.55	.45	.55
Propyl, norm, 50 gal drs gal.	...	.75	...	.75	...	.75
Aldehyde ammonia, 100 gal						
drs ... lb.	.80	.82	.80	.82	.80	.82
Alphanaphthol, crude, 300 lb						
bbls ... lb.	.60	.65	.60	.65	.65	.70
Alphanaphthylamine, 350 lb						
bbls ... lb.	.32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l,						
bbls, wks ... 100 lb.	...	3.00	...	3.00	2.90	3.00
25 bbls or more,						
wks ... 100 lb.	...	3.15	...	3.15	...	3.15
less than 25 bbls,						
wks ... 100 lb.	...	3.25	...	3.25	...	3.25
Granular, c-l, bbls, wks 100 lb.	...	2.75	...	2.75	...	2.75
25 bbls or more,						
wks ... 100 lb.	...	2.90	...	2.90	...	2.90
Powd, c-l, bbls, wks 100 lb.	...	3.15	...	3.15	...	3.15
25 bbls, or more,						
wks ... 100 lb.	...	3.30	...	3.30	...	3.30
Chrome, bbls ... 100 lb.	7.00	7.25	7.00	7.25	6.50	7.25
Potash, lump, c-1, bbls,						
wks ... 100 lb.	...	3.25	...	3.25	...	3.25
25 bbls or more,						
wks ... 100 lb.	...	3.40	...	3.40	...	3.40
Granular, c-l, bbls, wks 100 lb.	...	3.40	...	3.00	...	3.00
25 bbls or more, bbls,						
wks ... 100 lb.	...	3.00	...	3.15	...	3.15
Powd, c-l, bbls, wks 100 lb.	...	3.40	...	3.40	...	3.40
25 bbls or more,						
wks ... 100 lb.	...	3.55	...	3.55	...	3.55
Soda, bbls, wks ... 100 lb.	4.00	4.15	4.00	4.15	3.50	4.15
Aluminum metal, c-1						
NY ... 100 lb.	20.00	23.30	20.00	23.30	20.00	24.30
Acetate, CP, 20%, bbls lb.	.09	.10	.09	.10	.09	.10
Chloride anhyd, 99%,						
wks ... lb.	.07	.12	.07	.12	.07	.12
93%, wks ... lb.	.05	.08	.05	.08	.04	.08
Crystals, c-l, drs, wks ... lb.	.06½	.07	.06½	.07	.06½	.01
Solution, drs, wks ... lb.	.03	.03½	.03	.03½	.03	.03½
Hydrate, 96%, light, 90 lb.						
bbls, delv ... lb.	.13	.15	.13	.15	.13	.16½
heavy, bbls, wks ... lb.	.04	.04½	.04	.04½	.04	.04½
Oleate, drs ... lb.	...	.15¾	...	.15¾	...	.15¾
Palmitate, bbls ... lb.	.20	.21	.20	.21	.19	.21
Resinate, pp., bbls ... lb.	...	.15	...	.15	.12½	.15
Stearate, 100 lb bbls ... lb.	.17	.19	.17	.19	.17	.18
Sulfate, com, c-l, bgs,						
wks ... 100 lb.	...	1.35	...	1.35	1.35	1.35
c-l, bbls, wks ... 100 lb.	...	1.55	...	1.55	1.55	1.55
Sulfate, iron-free, c-l, bgs,						
wks ... 100 lb.	...	1.90	...	1.90	1.90	1.90
c-l, bbls, wks ... 100 lb.	...	2.05	...	2.05	2.05	2.05
Aminoazobenzene, 110 lb						
kgs ... lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd com, tks ... lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.15¼	.21½	.15¼	.21½	.15¼	.21½
26°, 800 lb drs, delv ... lb.	.02½	.03	.02½	.03	.02½	.03
Aqua 26° tks NH ... cont.	...	.05	...	.05	...	.05
tk wagon ... lb.	...	.024	...	.024	...	...
Ammonium Acetate, kgs ... lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b.						
plant ... 100 lb.	5.15	5.71	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls ... lb.	.15	.17	.15	.17	.15	.17
carbonate, tech, 500 lb						
bbls ... lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb						
bbls, wks ... 100 lb	4.45	4.90	4.45	4.90	4.45	5.25
Gray, 250 lb bbls wks ... lb.	5.00	5.75	5.00	5.75	5.00	5.75
Lump, 500 lbs cks spot lb.	.10½	.11	.10½	.11	.10	.11
Lactate, 500 lb bbls ... lb.	.15	.16	.15	.16	.15	.16
Linoleate ... lb.	.11	.12	.11	.12	.11	.12
Nitrate, tech, cks ... lb.	.04	.05	.04	.05	.03¾	.05
Oleate, drs ... lb.	...	.10	...	.10	...	.10
Oxalate, neut, cryst, powd,						
bbls ... lb.	.26	.27	.26	.27	.26	.27
pure, cryst, bbls, kgs ... lb.	.27	.28	.27	.28	.27	.28
Serchlorate, kgs ... lb.	...	.16	...	.16	.16	.16
Persulfate, 112 lb kgs ... lb.	.22½	.25	.22½	.25	.20	.25
Phosphate, dibasic tech,						
powd, 325 lb bbls ... lb.	.08	.10	.08	.10	.08	.11½
Sulfate, dom, f.o.b., bulk . ton	...	24.00	...	24.00	22.00	25.00
200 lb bgs ... ton	...	25.80	...	25.80	...	25.80
100 lb bgs ... lb.	...	26.50	...	26.50	...	26.50
Sulfocyanide, kgs ... lb.	...	.50	...	.50	...	.50
Amyl Acetate (from pentane)						
tks delv ... lb.	...	.13½	...	.13½	...	.13½
tech, drs, delv ... lb.	.142	.149	.142	.149	.142	.149
secondary, tks, delv ... lb.	...	.108	...	.108	.09	.108
c-l, drs, delv ... lb.	.118	.123	.118	.123	...	.123
Alcohol, see Alcohol, Amyl, also Fusel Oil.						

g Grain alcohol 20c a gal. higher in each case.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Amyl Chloride, norm drs, wks lb.	.56	.68	.56	.68	.56	.68
Chloride, mixed, drs,						
wks ... lb.	.07	.077	.07	.077	.07	12.2
tks, wks ... lb.	...	.06	...	.06	.06	10.5
Lactate, drs, wks ... lb.	...	.50	...	.50	...	.50
Mercaptan, drs, wks ... lb.	...	1.10	...	1.10	...	1.10
Stearate, drs, wks ... lb.	...	.31	...	.31	...	.31
Amylene, drs, wks ... lb.	.102	.11	.102	.11	.10	.11
tks, wks ... lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks lb.	.15	.17½	.15	.17½	.15	.17½
Annatto fine ... lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% ... lb.	...	.75	...	.75	...	.75
40% ... lb.	...	.18	...	.18	...	.18
Anthraqumone, sublimed, 125						
lb bbls ... lb.	.50	.52	.50	.52	.45	.50
Antimony, metal slabs, ton						
lots ... lb.	...	.14½	...	.14½	.07	.14½
Needle, powd, bbls ... lb.	.07¾	.08¼	.07¾	.08¼	.07	.09
Butter of, see Chloride.						
Chloride, soln cbys ... lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls ... lb.	.10¾	.11¾	.10¼	.11¾	.08	.11
Salt, 63% to 65%, tins ... lb.	.22	.24	.22	.24	.22	.24
Sulfuret, golden, bbls ... lb.	.19	.23	.19	.23	.16	.23
Vermilion, bbls ... lb.	.35	.42	.35	.42	.35	.42
Archil, conc, 600 lb bbls ... lb.	.21	.27	.21	.27	.21	.27
Double, 600 lb bbls ... lb.	.18	.20	.18	.20	.18	.20
Triple, 600 lb bbls ... lb.	.18	.20	.18	.20	.18	.20
Arglos, 80%, casks ... lb.	.15	.16	.15	.16	.15	.16
Crude, 30%, casks ... lb.	.07	.08	.07	.08	.07	.09
Aroclors, wks ... lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl ... lb.	.08¾	.09¾	.08¾	.09¾	.08¾	.09¼
Arsenic, Red, 224 lb cs kgs lb.	...	.15¾	...	.15¾	.14	.15¾
White, 112 lb kgs ... lb.	.03½	.04½	.03½	.04½	.03½	.05
Metal ... lb.	.40	.42	.40	.42	.40	.45
Asbestine, c-l wks ... ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate precip,						
200 lb bgs, wks ... ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat (witherite) 90% gr,						
c-l, wks, bgs ... ton	42.00	45.00	42.00	45.00	42.00	45.00
Chlorate, 112 lb kgs NY lb.	.14	.16	.14	.16	.14	.16
Chloride, 600 lb bbl wks ton	72.00	74.00	72.00	74.00	72.00	74.00
Dioxide, 88%, 690 lb drs lb.	.11	.12	.11	.12	.11	.13
Hydrate, 500 lb bbls ... lb.	.05½	.06	.05½	.06	.04¾	.06
Nitrate, 700 lb cks ... lb.	...	.08¼	...	.08¼	...	.08¼
Barytes, floated, 350 lb bbls						
wks ... ton	23.00	30.50	23.00	30.50	23.00	30.50
Bauxite, bulk, mines ... ton	7.00	10.00	7.00	10.00	5.00	10.00
Benzaldehyde, tech, 945 lb						
drs, wks ... lb.	.60	.62	.60	.62	.60	.65
Benzene (Benzol), 90%, Ind,						
8000 gal tks, frt allowed						
... gal.	...	.15	...	.15	.15	.20½
90% c-l, drs ... gal.	...	.24	...	.24	...	.24
Ind Pure, tks, frt allowed						
... gal.	...	.15	...	.15	.15	.20½
Benzidine Base, dry, 250 lb						
bbls ... lb.	.67	.69	.67	.69	.67	.69
Benzoyl Chloride, 500 lb drs lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech, drs ... lb.	.30	.40	.30	.40	.30	.40
Beta-Naphthol, 250 lb bbl,						
wks ... lb.	...	.24	...	.24	...	.24
Naphthylamine, sublimed,						
200 lb bbls ... lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ... lb.	.53	.55	.53	.55	.53	.58
Bismuth metal ...	1.10	1.20	1.10	1.20	1.10	1.30
Chloride, boxes ... lb.	3.20	3.25	3.20	3.25	...	...
Hydroxide, boxes ... lb.	3.15	3.20	3.15	3.20	...	...
Oxychloride, boxes ... lb.	2.95	3.00	2.95	3.00	...	...
Subbenzoate, boxes ... lb.	3.25	3.30	3.25	3.30	...	...
Subcarbonate, kgs ... lb.	1.55	1.65	1.55	1.70	...	...
Trioxide, powd, boxes ... lb.	3.45	3.50	3.45	3.50	...	...
Subnitrate ...	1.40	1.45	1.40	1.45	1.40	1.60
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls,						
wks ... ton *h*	42.50	70.00	42.50	70.00	42.50	70.00
Bleaching Powder, 800 lb drs						
c-l wks contract ... 100 lb.	...	1.90	...	1.90	...	1.90
lcl, drs, wks ... lb.	2.15	3.50	2.15	3.50	2.00	3.50
Blood, dried, f.o.b., NY ... unit	...	3.25	2.75	3.25	2.40	3.25
Chicago, high grade ... unit	...	3.25	3.25	3.75	2.00	3.10
Imported shipt ... unit	...	3.00	3.00	3.10	2.75	3.20
Blues, Bronze Chinese Milori						
Prussian Soluble ... lb.	.36½	.38	.36½	.38	.35½	.38
Bone, 4½ + 50% raw,						
Chicago ... ton	19.00	20.00	19.00	20.00	19.00	25.00
Bone Ash, 100 lb kgs ... lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls ... lb.	.05½	.08¼	.05½	.08¼	.05½	.08¼
Meal, 3% & 50%, imp ... ton	...	23.00	23.00	24.00	16.00	24.00
Domestic, bgs, Chicago ... ton	16.50	17.00	16.00	18.00	...	...
Borax, tech, gran, 80 ton lots,						
sacks, delv ... ton *i*	...	36.00	...	36.00	36.00	36.00
bbls, delv ... ton *i*	...	46.00	...	46.00	46.00	46.00
c-l, sacks, delv ... ton *i*	...	40.00	...	40.00	40.00	40.00
c-l, bbls, delv ... ton *i*	...	50.00	...	50.00	50.00	50.00
Tech, powd, 80 ton lots,						
sacks ... ton *i*	...	41.00	...	41.00	41.00	41.00
bbls, delv ... ton *i*	...	51.00	...	51.00	51.00	51.00
c-l, sacks, delv ... ton *i*	...	45.00	...	45.00	45.00	45.00
c-l, bbls, delv ... ton *i*	...	55.00	...	55.00	55.00	55.00
Bordeaux Mixture, jobbers,						
East, c-l, tins, drs, cases lb.	.08	.16	.08	.16	...	.16
Jobbers, West, c-l ... lb.	.08	.10	.08	.10	...	.10
Dealers, East, c-l ... lb.	.08½	.16½	.08½	.16½	...	.16½
Dealers, West, c-l ... lb.	.09	.11	.09	.11	...	.11

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Bromine, cases .. ..lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.80	1.50	.80	1.50	.80	1.50
Gold, blk ....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16-32° group 3 tks ....lb.	...	.04	...	.04	.02¾	.04
Butyl, Acetate, norm drs, frt allowed ....lb.	.13	.13½	.13	.13½	.11	.14
tks, frt allowed ....lb.	.12	.13	.12	.13	.10	.13
Secondary tks, frt allowed lb.	..	.096	...	.096	.08	.096
drs, frt, allowed ......lb.	.106	.111	.106	.111	...	.111
Aldehyde, 50 gal drs wks lbs.	.19	.21	.19	.21	.19	.36
Secondary, drs ....lb.	.60	.75	.60	.75	.60	.75
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Furoate, tech, 50 gal drs lb.	...	.65	...	.65	.60	.65
Lactate drs ....lb.	.22½	.23½	.22½	.23½	.22½	.29
Propionate, drs ....lb.	.18	.18½	.18	.18½	.17	.22
tks, delv ....lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs ....lb.	...	.26	..	.26	.25	.26
Tartrate, drs ....lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes...lb.	.75	.85	.75	.85	.65	.85
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	...	2.00	...	2.00	2.00	3.00
Arsenate, jobbers, East of Rocky Mts, drs ......lb.	.06	.06½	.06	.06½	...	...
dealers, drs ....lb.	.06¼	.07½	.06¼	.07½	...	...
South, jobbers, drs .....lb.	.06	.06½	.06	.06½	...	...
dealers, drs ....lb.	.06½	.06¾	.06¼	.06¾	...	...
Carbide, drs ....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l ....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, flake, 375 lb drs c-l wks ....ton	...	19.50	...	19.50	...	19.50
Solid, 650 lb drs c-l f.o.b. wks ....ton	...	17.50	...	17.50	...	17.50
Ferrocyanide, 350 lb bbls wks ....lb.	...	.17	...	.17	...	.17
Furoate, tech, 100 lb drs lb.	...	.25	...	.25	.25	.30
Gluconate, tech, 125 lb bbls ....lb.	...	.28	...	.28	.25	.28
Nitrate, 100 lb bgs ....ton	...	26.50	...	26.50	...	26.50
Palmitate, bbls ....lb.	.20	.21	.20	.21	.19	.20
Peroxide, 100 lb drs ....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls ....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip, bbls ...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls....lb.	.17	.19	.17	.19	.17	.19
Camphor, slabs ....lb.	.50	.52	.50	.52	.51	.59
Powder ....lb.	.50	.52	.50	.52	.51	.59
Camwood, Bk, ground bbls lb.	.16	.18	.16	.18	.16	.18
Carbon, Decolorizing, drs c-l ....lb.	.08	.15	.08	.15	.08	.15
Black, c-l, bgs, delv, price varying with zone ....lb.	.0445	.0535	.0445	.0535	.0445	.0535
lcl, bgs, delv, all zones lb.	...	.07	...	.07	.06½	.07
cartons, delv ....lb.	...	.07¾	...	.07¾	...	.07¾
cases, delv ....lb.	...	.08¼	...	.08¼	...	.08¼
Bisulfide, 500 lb drs....lb.	.05¼	.08	.05¼	.08	.05½	.08
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 1400 lb drs, delv ....lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom grd lb.	.13	.15	.09½	.15	..09¼	.13
80-100 mesh, c-l, bgs ....lb.	.13½	.16	.10	.16	.10	.14
Castor Pomace, 5½ NH_3, cl, bgs, wks ....ton	...	18.50	...	18.50	...	...
Imported, ship, bgs ....ton	...	18.75	18.75	20.00	...	...
Celluloid, Scraps, ivory cs lb.	.17	.18	.17	.18	.13	.18
Transparent, cs ....lb.	...	.20	...	.20	.16	.20
Cellulose, Acetate, 50 lb kgs ....lb.	.55	.60	.55	.60	.55	.90
Chalk, dropped, 175 lb bbls lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks ....lb.	.03	.04	.03	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	.12	.18
Willow, powd, 100 lb bbl wks ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bgs, delv ... .ton	25.00	30.00	25.00	30.00	...	...
Chestnut, clarified bbls wks lb.	...	.01⅞	...	.01⅞	.01⅝	.01⅞
25% tks wks ....lb	...	.01½	...	.01½	.01¼	.01½
Pwd, 60%, 100 lb bgs, wks ....lb	..	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	7.00	9.00
Powdered, bbls ....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks ...ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, blk ...ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls, lcl, wks contract ....lb.	.07½	.08½	.07½	.08½	.07	.08½
cyls, c-l, contract ...lb. *j*	...	.05½	...	.05½	...	.05½
Liq tk wks contract..100 lb.	..	2.00	...	2.00	1.85	2.00
Multi c-l cyls wks cont..lb.	2.15	2.40	2.15	2.40	2.00	2.40
Chloroacetophenone, tins, wks ....lb.	...	2.00	...	2.00	...	...
Chlorobenzene, Mono, 100 lb drs, lc-l, wks ....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs ....lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins ....lb.	.30	.31	.30	.31	.30	.35
Chloropicrin; comml cyls..lb.	.85	.90	.85	.90	.85	1.25
Chrome, Green, CP ......lb.	.20	.30	.20	.30	.20	.30
Commercial ....lb.	.06¼	.10	.06¼	.10	.06¼	.10
Yellow ....lb.	.15	.16	.15	.16	.15	.16
Chromium, Acetate, 8% Chrome bbls ....lb.	.05	.05¾	.05	.05¾	.05	.05¾
20° soln, 400 lb bbls ...lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb bbl ....lb.	.27	.28	.27	.28	.27	.28

j A delivered price.

Current

**Coal Tar
Diphenylguanidine**

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Coal tar, bbls .... bbl.	7.25	9.00	7.25	9.00	7.25	9.00
Cobalt Acetate, bbls ...... lb.	..	.60	...	.60	.60	.80
Carbonate tech, bbls .... lb.	1.35	1.40	1.35	1.40	1.34	1.40
Hydrate, bbls .... lb.	1.66	1.76	1.66	1.76	1.66	1.76
Linoleate, paste, bbls ... lb.	...	.30	...	.30	.30	.40
Resinate, fused, bbls ... lb.	...	.12½	...	.12½	...	.12½
Precipitated, bbls ...... lb.	...	.32	...	.32	.32	.42
Cobalt Oxide, black, bgs .. lb.	1.25	1.35	1.25	1.35	1.25	1.35
Cochineal, gray or bk bgs lb.	.34	.39	.34	.39	.33	.42
Teneriffe silver, bgs .... lb.	.35	.40	.35	.40	.34	.43
Copper, metal, electrol 100 lb.	...	9.00	...	9.00	7.87½	9.00
Carbonate, 400 lb bbls .. lb.	...	.08¼	...	.08¼	...	.08¾
52-54% bbls .... lb.	.14½	.16¼	.14½	.16¼	.15½	.16
Chloride, 250 lb bbls ... lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs .... lb.	.37	.38	.37	.38	.37	.40
Oleate, precip, bbls ..... lb.	...	.20	...	.20	...	.20
Oxide, red, 100 lb bbls .. lb.	.15	.17	.15	.17	.12½	.17
black bbls, wks ...... lb.	.14½	.15	.14	.16½	...	...
Resinate, precip, bbls ... lb.	.18	.19	.18	.19	.18	.19
Stearate, precip, bbls .. lb.	.35	.40	.35	.40	.35	.40
Sub-acetate verdigris, 400 lb bbls .... lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-l wks 100 lb.	...	3.85	...	3.85	3.75	3.85
Copperas, crys and sugar bulk c-l, wks, bgs .... ton	12.00	13.00	12.00	13.00	12.00	14.50
Corn Syrup, 42 deg, bbls .... 100 lb.	...	3.49	...	3.49	3.04	3.59
43 deg, bbls ...... 100 lb.	...	3.54	...	3.54	3.09	3.64
Cotton, Soluble, wet, 100 lb bbls .... lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls ..... lb.	..	.16¾	.16¼	.17¼	.17½	.19½
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks ...... gal.	.11½	.12½	.11½	.12½	.10	.12½
Grade 2 .... gal.	.10½	.11½	.10½	.11½	.10½	.12
Cresol, USP, drs .... lb.	.11	.11½	.11	.11½	.11	.11½
Crotonaldehyde, 98% 50 gal drs .... lb.	.32	.36	.32	.36	.26	.36
Cudbear, English .... lb.	.19	.25	.19	.25	.19	.25
Philippine, 100 lb bale .. lb.	.03½	.04¾	.03½	.04¾	.03½	.04¾
Cyanamid, bags c-l frt allowed Ammonia unit	...	1.07½	...	1.07½	...	1.07½
Dextrin, corn, 140 lb bgs f.o.b., Chicago ... 100 lb.	...	4.05	...	4.05	3.50	4.20
British Gum, bgs ... 100 lb.	...	4.20	...	4.20	3.75	4.60
White, 140 lb bgs .. 100 lb.	4.00	4.10	4.00	4.10	3.47	4.20
Potato, Yellow, 220 lb bgs .... lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl ... lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl .... lb.	...	.08¾	...	.08¾	.06¾	.08¾
Diamylamine, drs, wks .... lb.	...	1.00	...	1.00	...	1.00
Diamylene, drs, wks ...... lb.	.095	.102	.095	.102	.09	.102
tks, wks .... lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs .... lb.	.085	.092	.085	.092	.09	.77
tks, wks .... lb.	...	.075	...	.075	...	...
Diamylphthalate, drs wks gal.	.18	.19½	.18	.20½	...	.20½
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	..	1.10
Dianisidine, bbls .... lb.	2.25	2.45	2.25	2.45	2.35	2.45
Dibutylphthalate, drs, wks lb.	.20	.21	.20	.23	.20½	.21
Dibutyltartrate, 50 gal drs lb.	.29½	.31½	.29½	.31½	.29½	.31½
Dichlorethylene, drs ..... gal.	.29	...	.29	...	.29	...
Dichloroethylether, 50 gal drs, wks .... lb.	.16	.17	.16	.17	.16	.21
tks, wks .... lb.	...	.15	...	.15	...	.15
Dichloromethane, drs, wks lb.	...	.23	.15	.23	...	.15
Dichloropentanes, drs, wks lb.	.032	.040	.032	.040	.0278	.040
tks, wks .... lb.	...	.02½	...	.02½	...	.02½
Diethylamine, 400 lb drs .. lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethyl Carbinol, drs ..... lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31⅜	.35	.31⅜	.35	.31⅜	.35
90% grade, drs ...... lb.	...	.25	...	.25	...	.25
Diethylaniline, 850 lb drs .. lb.	.52	.55	.52	.55	.52	.55
Diethylorthotoluidin, drs .. lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb drs .... lb.	.18½	.19	.18½	.27	.26	.27
Diethylsulfate, tech, 50 gal drs .... lb.	...	...	...	...	...	...
Diethyleneglycol, drs ..... lb.	.15½	.17½	.15½	.17½	.14	.16
Mono ethyl ethers, drs .. lb.	.15	.17	.15	.17	.15	.17
tks, wks .... lb.	...	.15	...	.15	...	...
Mono butyl ether, drs .. lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs .... lb.	.26	.27	.26	.27	.26	.27
Diglycol Oleate, bbls ..... lb.	.16	.24	.16	.24	.16	.18
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis .... lb.	...	.95	...	.95	.95	1.20
Dimethylaniline, 340 lb drs lb.	.29	.30	.29	.30	.29	.30
Dimethyl Ethyl Carbinol, drs .... lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs ... lb.	.20	.21½	.20½	.24½	.24	.24½
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls .... lb. k	.17	.19½	.17	.19½	.17	.19½
Dintrochlorobenzene, 400 lb bbls .... lb.	.14	.15½	.14	.15½	.14	.15½
Dinitronaphthalene, 350 lb bbls .... lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.15½	.16½	.15½	.16½	.15½	.16½
Diphenyl .... lb.	.15	.25	.15	.25	.15	.25
Diphenylamine .... lb.	.31	.32	.31	.32	.31	.34
Diphenylguanidine, 100 lb bbl .... lb.	.36	.37	.36	.37	.36	.37

k Higher price is for purified material.

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt. ton	36.00	40.00	36.00	40.00	35.00	40.00
Extract . . . . lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb. cases . . . lb.	. . .	.56	.46	.56	.40	.54
Epsom Salt, tech, 300 lb bbls c-l NY . . . . 100 lb.	2.20	2.25	2.20	2.25	2.20	2.25
USP, c-l, bbls . . . . 100 lb.	. . .	2.25	. . .	2.25	2.25	2.25
Ether, USP anaesthesia 55 lb drs . . . . lb.	.22	.23	.22	.23	.22	.24
(Conc) . . . . lb.	.09	.10	.09	.10	.09	.10
Ether, Isopropyl 50 gal drs lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed . . . . lb.	. . .	.06	. . .	.06	. . .	. . .
Nitrous, conc, bottles . . . lb.	.75	.77	.75	.77	.75	.77
Synthetic, wks, drs . . . . lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks . . . . lb.	.07½	.08	.07½	.08	.07½	.08
drs . . . . lb.	.08½	.09	.08½	.09	.08½	.09
Anhydrous, tks . . . . lb.	. . .	.08½	. . .	.08½	.08½	.10
drs . . . . lb.	.09½	.10	.09½	.10	.09½	.10¼
Acetoacetate, 50 gal drs lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drs . . . . lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drs . . . . lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys . . . lb.	. . .	.30	. . .	.30	. . .	.30
Crotonate, drs . . . . lb.	1.00	1.25	1.00	1.25	1.00	1.25
Ether, Absolute, 50 gal drs . . . . lb.	.50	.52	.50	.52	.50	.52
Lactate, drs, wks . . . . lb.	.25	.29	.25	.29	.25	.33
Methyl Ketone, 50 gal drs, frt allowed . . . . lb.	.08½	.09	.08½	.09	.08½	.09
tks, frt allowed . . . . lb.	. . .	.07½	. . .	.07½	. . .	. . .
Oxalate, drs, wks . . . . lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks . . . . lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb drs . . . . lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont . . . . lb.	.75	.85	.75	.85	.75	.85
Dichloride, 50 gal drs . . lb.	.0545	.0994	.0545	.0994	.0545	.09
Glycol, 50 gal drs, wks lb.	.26	.28	.26	.28	.26	.28
Mono Butyl Ether, drs, wks	.20	.21	.20	.21	.20	.21
tks, wks . . . . lb.	. . .	.19	. . .	.19	.19	.19
Mono Ethyl Ether, drs, wks	.16	.17	.16	.17	.15	.17
tks, wks . . . . lb	. . .	.15	. . .	.15	.15	.15
Mono Ethyl Ether Acetate, drs, wks	.17½	.18½	.17½	.18½	.16½	.18½
tks, wks . . . . lb.	. . .	.16½	. . .	.16½	.16½	.16½
Mono, Methyl Ether, drs . . . . lb	.21	.23	.21	.23	.21	.23
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl . . . . lb.	. . .	.75	. . .	.75	. . .	.75
Ethylidenaniline . . . . lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery . . . . ton	. . .	14.50	. . .	14.50	. . .	14.50
Powd, blk, wks . . . . ton	14.00	14.50	14.00	14.50	13.50	14.50
Ferric Chloride, tech, crys, 475 lb bbls . . . . lb.	.05	.07½	.05	.07½	.05	.07½
sol, cbys . . . . lb.	.06¼	.06½	.06¼	.06½	. . .	. . .
Fish Scrap, dried, unground, wks . . . . unit *l*	. . .	2.50	. . .	2.50	2.25	2.60
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis . . . . unit *m*	. . .	2.00	. . .	2.00	2.00	2.50
Fluorspar, 98%, bgs	28.00	35.50	28.00	35.50	28.00	35.50
Formaldehyde, USP, 400 lb bbls, wks . . . . lb.	.06	.07	.06	.07	.06	.07
Fossil Flour . . . . lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines . . . . ton	6.50	15.00	6.50	15.00	6.50	15.00
Imp powd, c-l, bgs . . . . ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs . . . . lb.	. . .	.30	. . .	.30	. . .	.30
Furfuryl Acetate, 1 lb tins lb.	. . .	5.00	. . .	5.00	. . .	5.00
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.16	.18
Fustic, chips . . . . lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes . . lb.	.20	.23	.20	.23	.20	.23
Liquid 50°, 600 lb bbls . . lb.	.08½	.12	.08½	.12	.08½	.12
Solid, 50 lb boxes . . . . lb.	.16	.18	.16	.18	.16	.18
Sticks . . . . ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls . . lb.	.42	.43	.42	.43	.42	.43
Gall Extract . . . . lb.	.18	.20	.18	.20	.18	.20
Gambier, com 200 lb bgs . . lb.	. . .	.06	.05	.08	.04	.08
Singapore cubes, 150 lb bgs . . . . 100 lb.	.08	.09	.07⅛	.09⅛	.05	.09⅛
Gelatin, tech, 100 lb cs . . . lb.	.50	.55	.50	.55	.45	.55
Glauber's Salt, tech, c-l wks . . . . 100 lb.	1.10	1.30	1.10	1.30	1.10	1.30
Anhydrous, see Sodium Sulfate.						
Glucose (grape sugar) dry 70-80° bgs, c-l, NY . . 100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb. bgs . . . . 100 lb.	. . .	2.33	. . .	2.33	. . .	2.33
Glue, bone, com grades, c-l bgs . . . . lb.	. . .	.08	. . .	.08	.07	.12½
Better grades, c-l, bgs lb.	.09	.09½	.09	.09½	.09½	.16
Casein, kgs . . . . lb.	.18	.22	.18	.22	.18	.22
Hide, high grd, c-l, bgs . . lb.	.23	.28	.23	.28	.23	.28
Med grd, c-l, bgs . . . . lb.	.19	.23	.19	.23	.19	.23
Low grd, c-l, bgs . . . . lb.	.13½	.19	.13½	.19	.13½	.19
Glycerin, CP, 550 lb drs . . lb.	.14	.14½	.14	.14½	.11	.14½
Dynamite, 100 lb drs . . . lb.	.13¾	.14¼	.13¾	.14¼	.10	.14¼
Saponification, drs . . . . lb.	.10	.10½	.10	.10½	.06¾	.10½
Soap Lye, drs . . . . lb.	.09	.09¼	.09	.09¼	.06¼	.09⅛

l + 10; *m* + 50.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Glyceryl Phthalate ....lb.	...	.28	...	.28	...	.28
Glyceryl Stearate, bbls....lb.	...	.18	...	.18	...	.18
Glycol Phthallate ....lb.	...	.29	.28	.29.	...	.28
Glycol Stearate ....lb.	...	.23	.18	.23	.18	.20
Graphite,						
Crystalline, 500 lb bbls ....lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls .....lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls ....lb.	.03	.04	.03	.04	.03	.04
GUMS						
Gum Aloes, Barbadoes ....lb.	.87	.90	.87	.90	.85	.90
Animi (Zanzibar) bean & pea, 250 lb cases ....lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases ....lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts ......lb.	.09½	.10½	.09½	.10½	.07¾	.10⅝
White sorts, No. 1, bgs ....lb.	.21	.22	.21	.22	...	...
No. 2, bgs ....lb.	.20	.21	.20	.21	...	...
Powd, bbls ....lb.	.13½	.14½	.13½	.14½	...	...
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY ....lb.	.02½	.10½	.02½	.10½	.02½	.10½
Egyptian, 200 lb cases, f.o.b. NY ....lb.	.12	.15	.12	.15	.12	.15
California, f.o.b. NY, drs ....ton	29.00	55.00	29.00	55.00	...	...
Benzoin Sumatra, USP, 120 lb cases ....lb.	.25	.28	.20	.28	.18½	.23
Copal Congo, 112 lb bgs, clean, opaque ....lb.	.24½	.24⅝	.24⅛	.24⅝	.24⅛	.28
Dark, amber ....lb.	.08¾	.09¼	.08¾	.09¼	.08⅝	.10½
Light, amber ....lb.	.14⅝	.14⅞	.14⅝	.14⅞	.14⅜	.19
Copal, East India 180 lb bgs						
Macassar pale bold ....lb.	.09⅞	.10⅜	.09⅞	.10⅜	.09⅞	.10½
Chips ....lb.	.05½	.06	.05½	.06	...	...
Nubs ....lb.	.08½	.09	.08½	.09	...	...
Dust ....lb.	.03¾	.04¼	.03¾	.04¼	...	...
Singapore						
Bold ....lb.	.16½	.17	.16½	.17	.16	.17
Chips ....lb.	.04⅝	.05⅛	.04⅝	.05⅛	...	...
Nubs ....lb.	.10½	.11	.10½	.11	...	...
Dust ....lb.	.03¾	.04¼	.03¾	.04¼	...	...
Copal Manilla, 180-190 lb baskets, Loba A .....lb.	.11¾	.12¼	.11¾	.12¼	.11⅜	.14½
Loba B ....lb.	.10¼	.10¾	.10¼	.10¾	.10¼	.13½
Loba C ....lb.	.10⅛	.11⅜	.10⅛	.11⅜	.09¾	.12
MA sorts ....lb.	.06¾	.17¼	.06¾	.07¼	.06½	.07½
DBB ....lb.	.08	.08½	.08	.08½	.08	.09½
Dust ....lb.	.04⅞	.05⅜	.04⅞	.05⅜	...	...
Copal Pontianak, 224 lb cases, bold genuine ....lb.	.16⅛	.16⅝	.16⅛	.16⅝	.16⅛	.19
Mixed ....lb.	.14	.14½	.14	.14½	...	...
Chips ....lb.	.06⅞	.07⅞	.06⅞	.07⅞	...	...
Nubs ....lb.	.10¼	.10¾	.10¼	.10¾	...	...
Split ....lb.	.13⅞	.14⅜	.13⅞	.14⅜	...	...
Dammar Batavia, 136 lb cases						
A ....lb.	.19¾	.20¼	.19¾	.20¼	...	...
B ....lb.	.18¾	.19¼	.18¾	.19¼	...	...
C ....lb.	.16¾	.17¼	.16¾	.17¼	...	...
D ....lb.	.11¾	.12¼	.11¾	.12¼	...	...
A/D ....lb.	.14	.14½	.14	.14½	...	...
A/E ....lb.	.11¾	.12¼	.11¾	.12¼	...	...
E ....lb.	.07	.07½	.07	.07½	.07	.09½
F ....lb.	.06⅛	.06⅝	.06⅛	.06⅝	.05½	.06⅝
Singapore						
No. 1 ....lb.	.16½	.17	.16½	.17	.15½	.18
No. 2 ....lb.	.10¾	.11¼	.10¾	.11¼	.09⅜	.11
No. 3 ....lb.	.05⅛	.05⅝	.05⅛	.05⅝	.05⅛	.07
Chips ....lb.	.09¼	.09¾	.09¼	.09¾	.09	.10¼
Dust ....lb.	.05¼	.05¾	.05¼	.05¾	.05	.06
Seeds ....lb.	.06⅝	.07¼	.06⅝	.07¼	.06	.07¾
Ester ....lb.	.07¼	.08	.07¼	.08	...	...
Gamboge, pipe, cases .....lb.	.60	.65	.60	.65	.57	.65
Powdered, bbls ....lb.	.70	.75	.70	.75	.67	.75
Ghatti, sol. bgs ....lb.	.09	.09½	.09	.09½	.09	.09½
Karaya, pow bbls xxx ....lb.	.23	.25	.23	.25	.23	.25
xx ....lb.	.15	.16	.15	.16	.15	.16
No. 1 ....lb.	.08	.09	.08	.09	.08	.11
No. 2 ....lb.	.07	.08	.07	.08	.07	.09
Kauri, NY, San Francisco, Brown XXX, cases ....lb.	.60	.60½	.60	.60½	...	...
BX ....lb.	.33	.33½	.33	.33½	...	...
B1 ....lb.	.19	.19½	.19	.19½	...	...
B2 ....lb.	.14½	.15	.14½	.15	...	...
B3 ....lb.	.12	.12½	.12	.12½	...	...
Sale XXX ....lb.	.65	.65½	.65	.65½	...	...
No. 1 ....lb.	.40	.40½	.40	.40½	...	...
No. 2 ....lb.	.22	.22½	.22	.22½	...	...
No. 3 ....lb.	.15	.15½	.15	.15½	...	...
Kino, tins ....lb.	.75	.80	.75	.80	.75	.80
Mastic ....lb.	...	.55	.46	.46½	.35	.55½
Sandarac, prime quality, 200 lb bgs & 300 lb cks ...lb.	.32½	.34	.32½	.35½	.35	.50
Senegal, picked bgs ......lb.	.20	.21	.20	.21	17	.21
Sorts ....lb.	.09⅜	.10	.09⅜	.10	.08	.10
Thus, bbls ....280 lbs.	...	10.50	10.50	10.75	9.50	10.75
Strained ....280 lbs.	...	10.50	10.50	10.75	9.50	10.75
Tragacanth, No. 1, cases ....lb.	1.15	1.20	1.15	1.20	1.00	1.20
No. 2 ....lb.	1.05	1.10	1.05	1.10	...	...
No. 3 ....lb.	.95	1.00	.95	1.00	...	...
No. 4 ....lb.	.85	.90	.85	.90	...	...
No. 5 ....lb.	.75	.80	.75	.80	...	...
No. 6, bgs ....lb.	.14	.15	.14	.15	...	...
Sorts, bgs ....lb.	.11	.12	.11	.12	...	...
Yacca, bgs ....lb.	.03¼	.03¾	.03¼	.03¾	.03¼	.04

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Helium, cyl. (200 cu. ft.) cyl.	...	25.00	...	25.00	25.00	25.00
Hematite crystals, 400 lb						
bbls ....lb.	.16	.18	.16	.18	.16	.18
Paste, 500 bbls ....lb.	...	.11	...	.11	...	.11
Hemlock 25%, 600 lb bbls						
wks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.04½
tks ....lb.	...	.02½	...	.02½	...	...
Hexalene, 50 gal drs wks..lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C.						
Group 3, tks ....gal.	...	.14	...	.14	...	.14
Hexamethylenetetramine,						
drs ....lb.	.37	.39	.37	.39	.37	.39
Hexyl Acetate, delv drs ...lb.	.12	.12½	.12	.12½	.12	.12½
tks ....lb.	...	.11½	..	.11½	..	..
Hoof Meal, f.o.b. Chicago unit	...	2.50	2.50	2.70	1.85	2.70
South Amer. to arrive unit	...	1.85	...	1.85	1.65	1.80
Hydrogen Peroxide, 100 vol,						
140 lb cbys ....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride						
.....................lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.17	.20	.17	.20	.17	.20
Indigo Madras, bbls ......lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drs ....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid ....lb.	...	.12	...	.12	...	.12
Iodine, crude ....per kilo	...	15s 1d	...	15s 1d	...	15s 1d
Resublimed, kgs ....lb.	...	1.90	...	1.90	1.90	2.30
Irish Moss, ord, bales ....lb.	.09	.10	.09	.10	.07	.10
Bleached, prime, bales ..lb.	.18	.19	.18	.19	.14	.19
Iron Acetate Liq. 17°, bbls lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls ..100 lb.	2.75	3.25	2.75	3.25	2.75	3.25
Oxide, English ....lb.	.07½	.08¾	.07½	.08¾	.07½	.09
Isobutyl Carbinol (128-132°C)						
drs, wks ....lb.	.33	.34	.33	.34	.34	.34
tks, wks ....lb.	...	.32	...	.32	.32	.326
Isopropyl Acetate, tks ....lb.	...	.07½	...	.07½	.07	.07½
drs, frt allowed ....lb.	.08½	.09	.08½	.09	...	...
Ether, see Ether, isopropyl.						
Keiselguhr, 95 lb bgs, NY,						
Brown ....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, brown, broken,						
f.o.b. NY, bbls ....lb.	...	.09½	...	.09½	.09½	.09½
White, broken, bbls ....lb.	...	.11	...	.11	.11	.11
cryst bbls ....lb.	...	.10½	...	.10½	.10½	.10½
gran, bbls ....lb.	...	.11	...	.11	.11	.11
powd, bbls ....lb.	...	.11¼	...	.11¼	.11¼	.11¼
Arsenate, East, jobbers,						
drs ....lb.	.09	.09½	.09	.09½	...	...
Dealers, drs ....lb.	.09¼	.10½	.09¼	.10½	...	...
West, jobbers, drs .....lb.	...	.09	...	.09	...	...
dealers, drs ....lb.	...	.10	...	.10	...	...
Linoleate, solid bbls ......lb.	.26	.26½	.26	.26½	.26	.26½
Metal, c-l, NY ....100 lb	...	3.50	3.50	3.70	3.50	4.25
Red, dry, 95% Pb_2O_4,						
delv ....lb.	.065	.07	.06	.07	.06	.07¾
97% Pb_2O_4, delv .....lb.	.063	.07¼	.06¼	.07¼	...	...
98% Pb_2O_4, delv ....lb.	.0655	.07½	.06½	.07½	...	...
Nitrate, 500 lb bbls, wks..lb.	.10	.14	.10	.14	.10	.14
Oleate, bbls ....lb.	.15	.16	.15	.16	.15	.16
Resinate, precip, bbls ...lb.	...	.14	...	.14	.14	.18½
Stearate, bbls ....lb.	.22	.23	.22	.23	.22	.23
White, 500 lb bbls, wks..lb.	.06½	.07	.06½	.07	.06½	.07
Sulfate, 500 lb bbls, wks lb.	...	.06	...	.06	...	.06
Lime, chemical quicklime,						
f.o.b., wks, bulk .....ton	7.00	7.25	7.00	7.25	...	...
Hydrated, f.o.b., wks ..ton	8.50	12.00	8.50	12.00	...	...
Lime Salts, see Calcium Salts.						
Lime sulfur, sol, jobbers,						
tks ....gal.	...	.10	...	.10	...	...
drs ....gal.	.13½	.15½	.13½	.15½	...	...
Dealers, tks ....gal.	...	.10½	...	.10½	...	...
drs ....gal.	.14	.16½	.14	.16½	...	...
Linseed cake, bgs ....ton	...	29.50	29.50	37.50	21.50	37.50
Linseed Meal, bgs ....ton	...	31.00	31.00	40.00	30.50	41.00
Litharge, coml, delv, bbls..lb.	.0505	.06	.05	.06	.051	.06¾
Lithopone, dom, ordinary,						
delv, bgs ....lb.	.04½	.04¾	.04½	.04¾	.04½	.04¾
bbls ....lb.	.04¾	.05	.04¾	.05	.04¾	.05
High strength, bgs .....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Titanated, bgs ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Logwood, 51°, 600 lb bbls lb.	.08½	.10½	.08½	.10½	.08½	.12½
Solid, 50 lb boxes ......lb.	.13½	.17½	.13½	.17½	.13½	.17½
Sticks ....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	60.00	65.00	60.00	65.00	55.00	65.00
Magnesium Carb, tech, 70 lb						
bgs, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Chloride flake, 375 lb drs, c-l.						
wks ....ton	36.00	39.00	36.00	39.00	34.00	39.00
Magnesium fluosilicate, crys.						
400 lb bbls, wks .... lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb.						
bbls ....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls ...lb.	...	.50	...	.50	...	.50
Palmitate, bbls ....lb.	.22	.23	.22	.23	.21	.23
Stearate, bbls ....lb.	.19	.22	.19	.22	...	...
Linoleate, lig drs ......lb.	.18	.19	.18	.19	.18	.19
Resinate, fused, bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, bbls ....lb.	...	.12	...	.12	.11½	.12½
Manganese Borate, 30%, 200						
lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks ....lb.	.09	.12	.09	.12	.07	.12
Dioxide, tech (peroxide),						
drs ....lb.	.03¾	.06	.03¾	.06	.03¾	.06
Mangrove 55%, 400 lb bbls lb.	...	.04	...	.04	...	.04
Bark, African ....ton	...	29.00	29.00	30.00	26.00	32.00
Marble Flour, blk ....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride ....lb.	.73	.88	.73	.93	.73	.93

Current

Mercury
Orthodichlorobenzene

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Mercury metal ... 76 lb. flasks	...	73.50	...	73.50	66.50	79.00
Meta-nitro-aniline ....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ....lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb bbls ....lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs ....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Silicofluoride, bbls .....lb.	.09	.10	.09	.10	.09	.11
Stearate, bbls ....lb.	.19	.20	.19	.20	.19	.20
Meta-toluene-diamine, 300 lb bbls ....lb.	.67	.69	.67	.69	.67	.69
Methanol, 95%, frt allowed, drs ....gal. *o*	.37½	.58	.37½	.58	.37½	.58
tks, frt allowed ....gal. *o*	.33	.36½	.33	.36½	.33	.36½
97% frt allowed, drs gal. *o*	.38½	.59	.38½	.59	.38½	.59
tks, frt allowed ....gal. *o*	.34	.37½	.34	.37½	.34	.37½
Pure, frt allowed, drs gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed ....gal. *o*	.35½	.39	.35½	.39	.35½	.39
Synthetic, frt allowed, drs ....gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed ....gal. *o*	.35½	.39	.35½	.39	.35½	.39
Methyl Acetate, dom, 98-100%, drs ....lb.	.18	.18½	.18	.18½	.18	.18½
Synthetic, 410 lb drs ...lb.	.16	.17	.16	.17	.16	.17
tks ....lb.	...	.15	...	.15	.15	.15
Acetone, frt allowed, drs ....gal. *p*	.49½	.68½	.49½	.73½	...	...
tks, frt allowed, drs gal. *p*	.44	...	.44	.52½	...	...
Synthetic, frt allowed, east of Rocky M., drs gal. *p*	.57½	.60	.57½	.60	.57½	.60
tks, frt allowed	...	.53	...	.53	...	...
West of Rocky M., frt allowed, drs ....gal. *p*	.60	.63	.60	.63	...	...
tks, frt allowed ..gal. *p*	...	.56	...	.56	...	...
Hexyl Ketone, pure, drs lb.	...	.60	...	.60	.60	1.20
Anthraquinone ....lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks ......lb.	...	.10½	...	.10½	.10½	.10½
Chloride, 90 lb cyl .....lb.	...	.45	...	.45	.45	.45
Ethyl Ketone, tks ......lb.	...	.07½	...	.07½	.07½	.07½
Propyl carbinol, drs ...lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks ..lb.	35.00	...	35.00	...	...	...
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Molasses, blackstrap, tks, f.o.b. NY ....gal.	.08	.08¼	.07¾	.08¼	.06	.09
Monoamylamine, drs, wks lb.	...	1.00	...	1.00	...	1.00
Monochlorobenzene, see Chlorobenzene, mono.						
Monomethylparaminosulfate, 100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls..lb.	...	.04¼	...	.04¼	.03¾	.04¼
50% Solid, 50 lb boxes lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs ....ton	...	24.00	24.00	27.00	24.50	32.00
J2 bgs ....ton	...	15.00	15.00	15.75	15.75	18.00
R2 bgs ....ton	16.00	16.50	16.00	16.50	16.25	18.00
Naphtha. v.m. & p. (deodorized) see petroleum solvents.						
Naphthalene, dom, crude, bgs, wks ....lb.	1.65	2.40	1.65	2.40	...	...
Imported, cif, bgs ....lb.	...	1.90	...	1.90	1.75	1.90
Dyestuffs, bgs, bbls, Eastern wks ....lb.	.04¼	.04¾	.04¼	.04¾	...	...
Balls, ref'd, bbls, Eastern wks ....lb.	.04½	.05¼	.04½	.05¼	...	...
Flakes, ref'd, bbls, Eastern wks ....lb.	.04½	.05¼	.04½	.05¼	...	...
Dyestuffs, bgs, bbls, Mid-West wks ....lb. *q*	.04¾	.05¼	.04¾	.05¼	...	...
Balls, ref'd, bbls, Mid-West wks ....lb. *q*	.05	.05¾	.05	.05¾	...	...
Flakes, ref'd, bbls, Mid-West wks ....lb. *q*	.05	.05¾	.05	.05¾	...	...
Nickel Chloride, bbls .....lb.	.18	.19	.18	.19	.18	.19
Oxide, 100 lb kgs, NY..lb.	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY ...lb.	.12½	.13	.12½	.13	.11½	.13
Single, 400 lb bbls, NY lb.	.11½	.12	.11½	.12	.11½	.12
Metal ingot ....lb.	...	.35	...	.35	.35	.35
Nicotine, free 50%, 8 lb tins, cases	8.25	10.15	8.25	10.15	8.25	10.15
Sulfate, 55 lb drs ......lb.	.77	.80	.67	.80	.67	.75
Nitre Cake, blk ....ton	12.00	14.00	12.00	14.00	12.00	14.00
Nitrobenzene, redistilled, 1000 lb drs, wks ....lb.	.09	.11	.09	.11	.09	.11
tks ....lb.	...	.08½	...	.08½	...	.08½
Nitrocellulose, c-l-l cl, wks lb.	.27	.34	.27	.34	.27	.34
Nitrogenous Mat'l, bgs, imp ....unit	2.65	2.75	2.65	2.75	...	...
dom, Eastern wks ....unit	...	Nom.	...	Nom.	2.35	3.25
dom, Western wks ....unit	...	2.30	...	2.30	...	...
Nitronaphthalene, 550 lb bbls ....lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bgs .....lb.	.19	.20	.19	.20	.18	.20
Chinese, bgs ....lb.	.19	.20	.19	.20	.17	.20
Oak Bark Extract, 25%, bbls lb.	...	.03½	...	.03½	.03⅜	.03½
tks ....lb.	...	.02¾	...	.02¾	...	...
Orange-Mineral, 1100 lb cks NY ....lb.	.09¼	.10	.09¼	.10	.09¼	.10½
Orthoaminophenol, 50 lb kgs.lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.82	.84	.82	.84	.82	1.15
Orthochlorophenol, drs ....lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drs ....lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb drs ....lb.	.05½	.06	.05½	.06	.05½	.06

o Country is divided in 5 zones, prices varying by zone. In drum prices range covers both zone and c-l and lcl quantities in the 5 zones; in each case, bbl. prices are 2½c higher; synthetic is not shipped in bbls.; *p* Country is divided into 5 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Orthonitrochlorobenzene, 1200 lb drs. wks ....lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs, wks ....lb.	.05½	.06	.05½	.06	.05½	.06
Orthonitrophenol, 350 lb drs ....lb.	.52	.80	.52	.80	.52	.80
Orthotoluidine, 350 lb bbls, l-c-l ....lb.	.14½	.15	.14½	.15	.14	.15
Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70	.75	.70	.75
Osage Orange, cryst .....lb.	.17	.25	.17	.25	.16	.25
51 deg liquid ....lb.	.07	.07¾	.07	.07¾	.07	.07¾
Powd, 100 lb bgs ......lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, refd, 200 lb cs slabs						
122-127 deg M P ....lb.	.04	.04¾	.04	.04¾	.04½	.04¾
128-132 deg M P ....lb.	.05	.0515	.05	.0515	.04¾	.0515
133-137 deg M P ....lb.	.0575	.06	.0575	.06	.05	.06
Para aldehyde, 110-55 gal drs ....lb.	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs ....lb.	...	.85	...	.85	.52	.85
Aminohydrochloride, 100 lb kgs ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	.78	1.05
Chlorophenol, drs ......lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs ..lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr ....gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene 150 lb bbls wks ....lb.	.16	.20	.16	.20	.16	.20
Nitroacetanilid, 300 lb bbls ....lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ....lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs, wks ....lb.	.23½	.24	.23½	.24	.23½	.24
Nitro-orthotoluidine, 300 lb bbls ....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb bbls ....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.35	.37	.35	.37	.35	.37
Phenylenedamine, 350 lb bbls ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Para Tertiary amyl phenol, wks, drs ....lb.	.32	.50	.32	.50	.32	.50
Toluenesulfonamide, 175 lb bbls ....lb.	.70	.75	.70	.75	.70	.75
tks, wks ....lbs.	...	.31	...	.31	...	...
Toluenesulfonchloride, 410 lb bbls, wks ....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ....lb.	.56	.60	.56	.60	.56	.60
Paris Green, Arsenic Basis						
100 lb kgs ....lb.	...	.24	...	.24	.23	.24
250 lb kgs ....lb.	...	.22	...	.22	...	.22
Perchlorethylene, 50 gal drs ....lb.	...	.15	...	.15	...	.15
Persian Berry Ext, bbls ..lb.	.55	Nom.	.55	Nom.	.55	Nom.
Pentane, normal, 28-38°C, group 3 tks ....gal.	...	.09	...	.09	.09	.09
drs, group 3 ....gal.	.10	.15	.10	.15	...	...
Petrolatum, dark amber, bbls ....lb.	.02⅝	.02⅞	.02⅝	.02⅞	...	...
Light, bbls ....lb.	.02⅞	.03⅛	.02⅞	.03⅛	...	...
Medium, bbls ....lb.	.02¾	.03	.02¾	.03	...	...
Dark green, bbls ....lb.	.02½	.02¾	.02½	.02¾	...	...
White, lily, bbls ....lb.	.06⅜	.06½	.06⅜	.06½	...	...
White, snow, bbls ......lb.	.07⅜	.07½	.07⅜	.07½	...	...
Red, bbls ....lb.	.02½	.02¾	.02½	.02¾	...	...
Petroleum Ether, 30-60°, group 3, tks ....gal.	...	.13	...	.13	.11	.13
drs, group 3 ....gal.	.15	.16	.15	.16	.15	.17
PETROLEUM SOLVENTS AND DILUENTS						
Cleaners naphthas, group 3, tks, wks ....gal.	...	.06⅞	...	.06⅞	...	...
Bayonne, tks, wks ..gal.	...	.09	...	.09	...	...
West Coast, tks ....gal.	...	.15	...	.15	...	...
Hydrogenated naphthas, frt allowed East, tks ...gal.	...	.17½	...	.17½	...	...
No. 2, tks ....gal.	...	.22½	...	.22½	...	...
No. 3, tks ....gal.	...	.17½	...	.17½	...	...
No. 4, tks ....gal.	...	.22½	...	.22½	...	...
Lacquer diluents, tks, Bayonne ....gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks ....gal.	...	.07⅞	...	.07⅞	.06⅞	.08⅛
Naphtha, V.M.P., East, tks, wks ....gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ...gal.	...	.06⅞	...	.06⅞	.06¼	.07¼
Petroleum thinner, East, tks, wks ....gal.	...	.09	...	.09	.09	.09
Group 3, tks, wks ...gal.	...	.05⅞	...	.05⅞	.05⅞	.06⅜
Rubber Solvents, stand grd, East, tks, wks ......gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ..gal.	...	.06⅞	...	.06⅞	.06⅜	.06⅞
Stoddard Solvent, East, tks, wks ....gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ...gal.	...	.06⅜	...	.06⅜	.05¾	.07⅛
Phenol, 250-100 lb drs ....lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kgs ....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	.16	...	.16	...	.16
Phenylhydrazine Hydrochloride ....lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins ....lb.	20.00	22.00	20.00	22.00	20.00	22.00

Current

Phosphate Rock
Rosin Oil

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ....ton	...	3.25	...	3.25	2.85	3.25
70% basis ....ton	...	3.90	...	3.90	3.35	3.90
72% basis ....ton	...	4.40	...	4.40	3.85	4.40
75-74% basis ....ton	...	5.40	...	5.40	4.90	5.40
75% basis ....ton	...	5.50	...	5.50	5.05	5.50
77-80% basis ....ton	...	6.50	...	6.50	5.90	6.50
Tennessee, 72% basis ..ton	...	4.75	...	4.75	4.75	5.00
Phosphorous Oxychloride 175 lb cyl ....lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases ....lb.	.44	.45	.44	.45	.44	.45
Yellow, 110 lb cs, wks..lb.	.28	.33	.28	.33	.28	.33
Sesquisulfide, 100 lb cs..lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl ....lb.	.16	.20	.16	.20	.16	.20
Phthalic Anhydride, 100 lb drs, wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	.48	.50	.48	.50	.48	.62
Steam dist wat wh bbls gal.	.64	.65	.64	.65	.64	.65
tks ....gal.	...	.59	...	.59	...	...
Straw color, bbls ....gal.	...	.59	...	.59	...	...
tks ....gal.	...	.54	...	.54	...	...
Pitch Hardwood, wks ....ton	...	15.00	15.00	20.00	...	20.00
Burgundy, dom, bbls, wks ....lb.	...	.03½	...	.03½	...	...
Imported ....lb.	.11	.13	.11	.13	...	...
Coaltar, bbls, wks ....ton	...	19.00	...	19.00	...	...
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	3.75	4.25	3.75	4.25	...	...
Stearin, drs ....lb.	.03	.04½	.03	.04½	...	...
Platinum, refd ....oz.	35.00	36.00	35.00	36.00	35.00	38.00
POTASH						
Potash, Caustic, wks, sol..lb.	.06¼	.06½	.06¼	.06½	.06¼	.07⅜
flake ....lb.	.07	.07⅜	.07	.07⅜	.07	.08¼
Liquid tks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.03⅝
Potash Salts, Rough Kainit 14% basis ....ton	...	8.50	...	8.50	8.50	9.70
Manure Salts, imported						
20% basis, blk ....ton	...	8.60	...	8.60	8.60	12.00
30% basis, blk ....ton	...	12.90	...	12.90	12.90	19.15
Domestic, cif ports, blk unit	...	.43	...	.43	...	...
Potassium Acetate ....lb.	.26	.28	.26	.28	.26	.28
Potassium Muriate, 80% basis bgs ....ton	...	22.00	...	22.00	22.00	37.15
Dom, blk ....unit	...	.40	...	.40	...	...
Pot & Mag Sulfate, 48% basis bgs ....ton	...	22.50	...	22.50	22.50	25.00
Potassium Sulfate, 90% basis bgs ....ton	...	35.00	...	35.00	35.00	42.15
Potassium Bicarbonate, USP 320 lb bbls ....lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb cks ....lb.	.08⅛	.08⅝	.08⅛	.08⅝	.08⅛	.08⅝
Binoxalate, 300 lb bbls..lb.	.22	.23	.22	.23	.14	.23
Bisulfate, 100 lb kgs ..lb.	.35	.36	.35	.36	.33	.36
Carbonate, 80-85% calc 800 lb cks ....lb.	.07½	.07⅞	.07½	.07⅞	.07	.07⅞
liquid, tks ....lb.	...	...	...	...	...	...
drs, wks ....lb.	...	...	...	...	...	...
Chlorate crys, powd, 112 lb kgs, wks ....lb.	...	.09¾	...	.09¾	.08½	.09¾
gran, kgs ....lb.	.12	.13	.12	.13	...	...
powd, kgs ....lb.	.08¾	.09¾	.08¾	.09¾	...	...
Chloride, crys, bbls ....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs ....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb cases ..lb.	.55	.57½	.55	.57½	.55	.60
Iodide, 75 lb bbls ....lb.	...	1.40	...	1.40	1.40	2.70
Metabisulfite, 300 lb bbls lb.	...	.15	...	.15	.10½	.15
Oxalate, bbls ....lb.	.16	.24	.16	.24	.16	.24
Perchlorate, cks, wks ..lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, 112 lb kgs lb.	.35	.38½	.35	.38½	.35	.39
Yellow, 500 lb casks ..lb.	.18	.19	.18	.19	.18	.19
Tartrate Neut, 100 lb kgs lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls ....lb.	.32	.35	.32	.35	.32	.35
Propane, group 3, tks	...	.07	...	.07	...	.07
Pumice Stone, lump bgs ..lb.	.04½	.06	.04½	.06	.04½	.06
250 lb bbls ....lb.	.05	.07	.05	.07	.05	.07
Powd, 350 lb bgs ....lb.	.02½	.03	.02½	.03	.02½	.03
Putty, coml, tubs ....100 lb.	...	2.75	...	2.75	2.25	2.75
Linseed Oil, kgs ...100 lb.	...	4.50	...	4.50	4.00	4.50
Pyridine, 50 gal drs ....gal.	...	1.25	...	1.25	...	1.25
Pyrites, Spanish cif Atlantic ports, blk ....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins ....lb.	2.75	3.00	2.75	3.00	2.75	3.00
Quebracho, 35% liq tks ...lb.	...	.02⅝	...	.02⅝	.02¼	.02⅝
450 lb bbls, c-l ....lb.	...	.03⅛	...	.03⅛	.02¾	.03⅛
Solid, 63%, 100 lb bales cif ....lb.	...	.03⅝	...	.03⅝	.02⅞	.03⅝
Clarified, 64%, bales..lb.	...	.03⅞	...	.03⅞	.03	.03⅞
Quercitron, 51 deg liq, 450 lb bbls ....lb.	.06	.06½	.06	.06½	.05½	.06½
Solid, 100 lb boxes ....lb.	.10	.12	.10	.12	.09½	.13
R Salt, 250 lb bbls, wks ..lb.	.44	.45	.44	.45	.40	.45
Resorcinol tech, cans ....lb.	.75	.80	.75	.80	.65	.80
Rochelle Salt, cryst ....lb.	.14½	.15	.14½	.15	.12½	.16
Powd, bbls ....lb.	...	.13½	...	.13½	...	...
Rosin Oil, bbls, first run gal.	...	.38	.38	.45	.45	.48
Second run ....gal.	...	.43	.43	.48	.48	.53
Third run, drs ....gal.	..	.50	.50	.60	...	...

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:						
B	...	5.10	5.10	5.25	4.50	5.75
D	...	5.25	..	5.25	4.60	5.85
E	...	5.45	5.25	5.45	4.80	6.50
F	...	5.90	5.35	5.90	5.00	6.75
G	...	5.95	5.45	5.95	5.05	6.75
H	...	5.95	5.50	5.97½	5.10	6.75
I	...	5.95	5.55	6.00	6.75	4.05
K	...	5.97½	5.65	6.00	5.30	6.75
M	...	6.00	5.65	6.02½	5.45	6.80
N	...	6.40	5.75	6.40	5.50	6.80
WG	...	6.85	6.05	6.87½	5.70	6.80
WW	...	7.45	6.40	7.55	5.90	6.85
Rosins, Gum, Savannah (280 lb unit):						
B	...	3.95	3.80	4.00	...	...
D	...	4.00	4.00	4.20	...	...
E	...	4.20	4.00	4.20	...	...
F	...	4.65	4.15	4.65	...	...
G	...	4.70	4.25	4.70	...	...
H	...	4.70	4.30	4.75	...	...
I	...	4.70	4.35	4.75	...	...
K	...	4.72½	4.45	4.75	...	...
M	...	4.75	4.45	4.75	...	...
N	...	5.15	4.50	5.15	...	...
WG	...	5.60	4.80	5.60	...	...
WW	...	6.20	5.25	6.20	...	...
X	...	6.20	5.25	6.20	...	...
Rosins, Wood, wks (280 lb unit), FF	5.40	6.35	4.30	6.35	...	...
I	6.05	7.00	4.65	7.00	...	...
M	6.30	7.25	5.00	7.25	...	...
N	6.80	7.75	5.40	7.75	...	...
Rosin, Wood. c-l, FF grade, NY	...	5.30	5.10	5.30	5.10	6.13
Rotten Stone, bgs mines ..ton	23.50	24.00	23.50	24.00	23.50	24.00
Lump, imported, bbls ..lb.	.05	.07	.05	.07	.05	.07
Selected, bbls ....lb.	.08	.10	.08	.10	.08	.12
Powdered, bbls ....lb.	.02½	.05	.02½	.05	.02½	.05
Sago Flour, 150 lb bgs ....lb.	.02¾	.03¾	.02¾	.03¾	.02½	.03¾
Sal Soda, bbls, wks ..100 lb.	...	1.30	...	1.30	1.10	1.30
Salt Cake, 94-96%, c-l, wks ....ton	13.00	18.00	13.00	18.00	13.00	18.00
Chrome, c-l, wks ......ton	12.00	13.00	12.00	13.00	12.00	13.00
Saltpetre, double refd, gran, 450-500 lb bbls ......lb.	.059	.06¼	.059	.06¼	.059	.06¼
Powd, bbls ....lb.	.069	.07⅞	.069	.07⅞	...	...
Cryst, bbls ....lb.	.069	.08	.069	.08	...	...
Satin, White, 550 lb bbls ..lb.	...	.01½	...	.01½	...	.01½
Shellac, Bone dry, bbls ..lb. r	.21	.22	.21	.32	.26	.37
Garnet, bgs ....lb.	.19	.23	.19	.27	.26	.32
Superfine, bgs ....lb. s	.17	.19	.17	.28	.23	.31
T. N., bgs ....lb. s	.14	.16	.14	.25	...	...
Schaeffer's Salt, kgs ......lb.	.48	.50	.48	.50	.48	.50
Silver Nitrate, vials ......oz.	...	.39⅜	.38	.39⅜	.31⅞	.40½
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	...	1.25	...	1.25	...	1.25
58% light, bgs .....100 lb.	...	1.23	...	1.23	...	1.25
blk ....100 lb.	...	1.05	...	1.05	...	1.05
paper bgs ....100 lb.	...	1.20	...	1.20	...	1.20
bbls ....100 lb.	...	1.50	...	1.50	...	1.50
Soda Caustic, 76% grnd & flake, drs ....100 lb.	...	3.00	...	3.00	...	3.00
76% solid, drs .....100 lb.	...	2.60	...	2.60	...	2.60
Liquid sellers, tks, 100 lbs.	...	2.25	...	2.25	...	2.25
Sodium Abietate, drs .....lb.	...	.08	...	.08	.03	.08
Acetate, tech, 450 lb bbls, wks ....lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs ....lb.	...	.64	...	.64	.50	.64
Arsenate, drs ....lb.	...	.10½	...	.10½	.07¾	.10½
Arsenite, liq, drs .....gal.	.40	.75	.40	.75	.40	.75
Benzoate, USP, kgs .. lb.	.46	.48	.46	.48	.45	.48
Bicarb, 400 lb bbl, wks. 100 lb.	...	1.85	...	1.85	1.85	1.85
Bichromate, 500 lb cks, wks ....lb.	.06⅛	.06⅝	.06⅛	.06⅝	.06⅛	.06⅝
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03	.036
35-40% sol cbys, wks 100 lb.	1.95	2.10	1.95	2.10	...	...
Chlorate, bgs, wks .....lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Chloride, tech ....ton	13.60	16.50	13.60	16.50	11.40	16.50
Cyanide, 96-98%, 100 & 250 lb drs, wks ......lb.	.15½	.17½	.15½	.17½	.15½	.17½
Fluoride, 90%, 300 lb bbls, wks ....lb.	.07¼	.08¼	.07¼	.08¼	.07¼	.09½
Hydrosulfite, 200 lb bbls, f.o.b. wks ....lb.	.19	.20	.19	.21	.19½	.21
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.50	3.00	2.50	3.00	2.40	3.00
Tech, reg cryst, 375 lb bbls, wks ......100 lb.	2.40	2.75	2.40	2.75	2.40	2.75
Iodide ....lb.	...	2.40	...	2.40	2.40	3.50
Metanilate, 150 lb bbls ..lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks ....100 lb.	2.65	3.05	2.65	3.05	2.65	3.05
cryst, bbls, wks ..100 lb.	...	3.25	...	3.25	...	3.25
Monohydrate, bbls .....lb.	...	.02½	...	.02½	...	.02½
Napthenate, drs ....lb.	...	.09	...	.09	.09	.13
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY ....ton	...	24.80	...	24.80	24.80	26.30
100 lb bgs ....ton	...	25.50	...	25.50	25.50	27.00
Bulk ....ton	...	23.50	...	23.50	23.50	24.50

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; *s* T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Sodium (continued)						
Nitrite, 500 lb bbls ....lb.	.07¼	.08	.07¼	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls ..lb.	.18	.19	.18	.19	.18	.19
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.20	...	2.20	2.10	2.40
bgs, wks ......100 lb.	...	2.00	...	2.00	...	...
tri-sodium, tech, 325 lb bbls, wks ......100 lb.	...	2.60	...	2.60	2.60	2.70
bgs, wks ......100 lb.	...	2.60	...	2.60	...	...
Picramate, 160 lb kgs ..lb.	.67	.69	.67	.69	.69	.72
Prussiate, Yellow, 350 lb bbl, wks ....lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, anhyd, 100 lb bbls ....lb.	.102	.132	.102	.15	...	.15
Silicate, 60°, 55 gal drs, wks ....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40°, 35 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks ....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.04½	.04¾	.04½	.04¾	.04¾	.06
Stannate, 100 lb drs ....lb.	.32	.35	.31	.37	.33½	.37½
Stearate, bbls ....lb.	.20	.25	.20	.25	.20	.25
Sulfanilate, 400 lb bbls..lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l, wks ....100 lb. *t*	1.15	1.50	1.15	2.35	2.20	2.85
Sulfide, 80% cryst, 440 lb bbls, wks ....lb.	...	.02¼	...	.02¼	.02¼	.02½
62% solid, 650 lb drs, c-l, wks ....lb.	...	.03	...	.03	...	.03
Sulfite, cryst, 400 lb bbls, wks ....lb.	.023	.02½	.023	.02½	.02¼	.02½
Sulfocyanide, bbls .....lb.	.32	.42½	.32	.42½	.28	.42½
Tungstate, tech, crys, kgs ....lb.	...	.90	...	.90	.70	.90
Spruce Extract, ord, tks ..lb.	...	.01	...	.01	...	.01
Ordinary, bbls ....lb.	...	.01½	...	.01½	...	.01½
Super spruce ext, tks ...lb.	...	.01⅝	...	.01⅝	...	.01⅜
Super spruce ext, bbls ..lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs ....100 lb.	3.46	3.56	3.46	3.56	2.81	3.76
Powd, 140 lb bgs ...100 lb.	3.56	3.66	3.56	3.66	2.71	3.66
Potato, 200 lb bgs ......lb.	.05¼	.06	.05¼	.06	.05¼	.06
Imp, bgs ....lb.	.06	.06½	.06	.06½	.06	.06½
Rice, 200 lb bbls ....lb.	.07½	.08½	.07½	.08½	.07½	.08½
Wheat, thick bgs ....lb.	...	.08¼	...	.08¼	.06¼	.08¼
Strontium carbonate, 600 lb. bbls, wks ....lb.	.07¼	.07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY ....lb.	.08¾	.09½	.08¾	.09½	.08¾	.11
Sulfur	...	...	...	...	...	...
Crude, f.o.b. mines ....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour, coml, bgs ....100 lb.	1.60	2.35	1.60	2.35	1.60	2.35
bbls ....100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs ..100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.55	3.15	2.55	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Superfine, bgs .....100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls ....100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs ....100 lb.	2.35	3.10	2.35	3.10	2.35	3.10
bbls ....100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, red, 700 lb drs, wks ....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs, wks lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl lb.	.08½	.10	.08½	.10	.07	.10
Multiole units, wks ....lb.	...	.06½	...	.06½	...	...
tks, wks ....lb.	...	.04¾	...	.04¾	...	...
Refrigeration, cyl, wks ...lb.	...	.13	...	.13	...	...
Multiple units, wks ....lb.	...	.09¼	...	.09¼	...	...
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ......ton	59.00	62.00	...	60.00	58.00	75.00
dom, bgs, wks ....ton	...	35.00	...	35.00	...	...
Superphosphate, 16% bulk, wks ....ton	...	8.50	...	8.50	8.00	8.50
Run of pile ....ton	...	8.00	...	8.00	7.50	8.00
Talc, Crude, 100 lb bgs, NY ....ton	14.00	15.00	14.00	15.00	12.00	15.00
Refd, 100 lb bgs, NY ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bgs, NY ton	22.00	30.00	22.00	30.00	27.50	30.00
Refd, white, bgs .....ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	70.00	75.00	70.00	75.00	70.00	75.00
Refd, white, bgs, NY ton	75.00	80.00	75.00	80.00	75.00	80.00
Tankage Grd, NY ....unit *u*	...	2.75	2.65	2.75	2.50	3.25
Ungrd ....unit *u*	...	2.40	2.40	2.50	2.00	2.75
Fert grade, f.o.b. Chicago ....unit *u*	...	2.50	2.50	2.60	1.80	2.40
South American cif..unit *u*	...	3.00	3.00	3.15	2.75	3.10
Tapioca Flour, high grade, bgs ....lb.	.0215	.05	.0215	.05	.0215	.05
Tar Acid Oil, 15%, drs gal.	.21	.22	.21	.22	.21	.22
25%, drs ....gal.	.23	.24	.23	.24	.23	.24
Tar, pine, delv, drs .....gal.	.25	.26	.25	.26	...	...
tks, delv ....gal.	...	.20	...	.20	...	...
Tartar Emetic, tech ......lb.	.22¾	.23	.22¾	.23	.23	.23
USP, bbls ....lb.	.28	.28½	.28	.28½	.27	.28½
Terpineol, den grd, drs ...lb.	.13¾	.14¾	.13¾	.14¾	...	...
tks ....lb.	.13	.14	.13	.14	...	...
Tetrachlorethane, 50 gal drs lb.	.08½	.09	.08½	.09	.08½	.09
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl lb.	.20	.25	.20	.25	.20	.25

t Bags 15c lower; *u* + 10.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Tin, crystals, 500 lb bbls, wks ....lb.	.36½	.37	.36	.38½	.30	.40½
Metal, NY ....lb.	...	.508	...	.508	.50⅞	.55⅜
Oxide, 300 lb bbls, wks lb.	.52	.53	.52	.58	.55	.60
Tetrachloride, 100 lb drs, wks ....lb.	...	.24¾	.24¾	.26	.25½	.28½
Titanium Dioxide, 300 lb bbls ....lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.19¼
Barium Pigment, bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Calcium Pigment, bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Toluol, 110 gal drs, wks gal.	...	.35	...	.35	...	.35
8000 gal tks, frt allowed gal.	...	.30	...	.30	...	.30
Toluidine, mixed, 900 lb drs, wks ....lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls ....lb.	.75	.80	.75	.80	.75	.85
Para, red, bbls ....lb.	...	.75	...	.75	.75	.80
Toluidine, bgs ....lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	.32	.36	.32	.36	.32	.36
Triamyl Borate, drs, wks lb.	...	.40	...	.40	...	.40
Triamylamine, drs, wks ...lb.	...	1.25	...	1.25	1.00	1.25
Trichlorethylene, 50 gal drs lb.	.09½	.10	.09½	.10	.09½	.10
Triethanolamine, 50 gal drs ....lb.	.35	.38	.35	.38	.35	.38
Tricresyl Phosphate, drs ..lb.	.21	.23	.21	.23	.19	.26
Triphenyl Guanidine ....lb.	.58	.60	.58	.60	.58	.60
Tripoli, airfloated, bgs, wks ....ton	27.50	30.00	27.50	30.00	...	...
Tungsten, Wolframite per unit	15.00	15.25	15.00	15.25	12.00	15.25
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.55½	.49¾	.55½	.46¼	.63½
Savannah, bbls ....gal.	...	.50¼	.45	.50¼	.41¼	.58½
Jacksonville, bbls ....gal.	...	.50	.45	.50¼	.41¼	.58½
Wood Steam dist, bbls, c-l, NY ....gal.	...	.49	.45	.49	.41	.61
Urea, pure, 112 lb cases ..lb.	.15½	.17	.15½	.17	.15	.17
Fert grade, bgs c.i.f. ..ton	100.00	120.00	100.00	120.00	90.00	120.00
c.i.f. S.A. points ....ton	100.00	120.00	100.00	120.00	90.00	120.00
Urea Ammonia liq 55% NH_3, tks ....unit	...	.96	...	.96	...	.96
Valonia beard, 42%, tannin bgs ....ton	...	42.50	42.50	43.50	39.00	48.00
Cups, 32% tannin, bgs..ton	...	27.50	27.50	28.50	23.00	32.50
Mixture, bark, bgs ....ton	...	32.00	...	32.00	...	32.00
Vermillion, English, kgs ..lb.	1.56	1.70	1.56	1.70	1.41	1.73
Vinyl Chloride, 16 lb cyl ..lb.	...	1.00	...	1.00	...	1.00
Wattle Bark, bgs ....ton	...	29.25	29.25	32.00	29.50	34.00
Extract, 60°, tks, bbls ..lb.	...	.03¾	...	.03¾	.03⅝	.03⅞

WAXES

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Wax, Bayberry, bgs ....lb.	.22	.23	.22	.23	.25	.30
Bees, bleached, white 500 lb slabs, cases ....lb.	.33½	.34	.33½	.34	.32	.37
Yellow, African, bgs ..lb.	.21¾	.22½	.21	.22½	.16	.22
Brazilian, bgs ....lb.	.22	.24	.22	.24½	...	...
Chilean, bgs ....lb.	.22	.24	.22	.24½	...	...
Refined, 500 lb slabs, cases ....lb.	.27½	.28	.27½	.28	.21	.29
Candelilla, bgs ....lb.	.10¾	.11½	.10	.12½	.10¼	.14½
Carnauba, No. 1, yellow, bgs ....lb.	.36½	.38½	.35	.40	.30	.40
No. 2, yellow, bgs ....lb.	.36	.37	.34	.39	.34	.41
No. 2, N. C., bgs ....lb.	.28	.29	.26½	.29	.20	.29
No. 3, Chalky, bgs ...lb.	.24½	.26½	.21	.26½	...	...
No. 3, N. C., bgs ....lb.	.26	.28	.22½	.28	.16¼	.25
Ceresin, white, imp, bgs lb.	.43	.45	.43	.45	...	...
Yellow, bgs ....lb.	.36	.38	.36	.38	...	...
Domestic, bgs ....lb.	.08	.11	.08	.11	...	...
Japan, 224 lb cases ....lb.	.06¾	.07	.06	.07	.06	.07½
Montan, crude, bgs ....lb.	.10½	.11½	.10½	.11½	.10	.11
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.21	.22	.19	.22	.18	.20
Cakes, cases ....lb.	.22	.23	.20	.23	.19	.21
Whiting, 200 lb bgs, c-l, wks ....ton	...	12.00	...	12.00	...	...
Alba, bgs, c-l, NY ....ton	...	15.00	...	15.00	...	15.00
Gliders, bgs, c-l, NY ...ton	...	15.00	...	15.00	...	...
Wood Flour, c-l, bgs ....ton	18.00	30.00	18.00	30.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks ....gal.	.27	.29	.27	.29	.27	.29
Coml, tks, wks ....gal.	...	.26	...	.26	...	.26
Xylidine, mixed crude, drs lb.	.36	.37	.36	.37	.36	.37
Zinc, Carbonate tech, bbls, NY ....lb.	.09½	.11	.09½	.11	.09½	.11
Chloride fused, 600 lb drs, wks ....lb.	.04½	.05¾	.04½	.05¾	.04¼	.05¼
Gran, 500 lb bbls, wks ..lb.	.05	.05¾	.05	.05¾	.05⅛	.06
Soln 50%, tks, wks..100 lb.	...	2.00	...	2.00	...	2.00
Cyanide, 100 lb drs ....lb.	.36	.41	.36	.41	.36	.41
Zinc Dust, 500 lb bbls, c-l, delv ....lb.	...	.0585	.057	.0585	.0567½	.071
Metal, high grade slabs, c-l, NY ....100 lb.	...	4.075	...	4.075	4.05	4.75
E. St. Louis ....100 lb.	.0370	.027	.027	.03725	3.70	4.46
Oxide, Amer, bgs, wks..lb.	.05¾	.06¼	.05¾	.06¼	.05¾	.06¼
French, 300 lb bbls, wks ....lb.	.06½	.10⅞	.06½	.10⅞	.05¾	.11⅛
Palmitate, bbls ....lb.	.21	.22	.21	.22	.20	.22
Perborate, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls ....lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Stearate, 50 lb bbls ....lb.	.18	.21	.18	.21	.18	.21

Current

Zinc Sulfate
Oil, Whale

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Zinc Sulfate, crys, 400 lb bbl, wks . . . lb.	.028	.033	.028	.033	.02¾	.033
Flake, bbls . . . lb.	.035	.032	.035	.032	...	...
Sulfide, 500 lb bbls, delv lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.13½
bgs, delv . . . lb.	.10½	.11½	.10½	.11½	...	...
Sulfocarbolate, 100 lb kgs . . . lb.	.24	.25	.24	.25	.21	.25
Zirconium Oxide, Nat kgs lb.	.02½	.03	.02½	.03	.02½	.03
Pure, kgs . . . lb.	.45	.50	.45	.50	.45	.50
Semi-refined, kgs . . . lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Castor, No. 3, 400 lb bbls . . lb.	.09¾	.10½	.09¾	.10½	.09¾	.10½
Blown, 400 lb bbls . . . lb.	.11½	.12¼	.11½	.12¼	.11½	.12¾
China Wood, bbls spot NY lb.	.12¼	.12½	.094	.12½	.07½	.099
Tks, spot NY . . . lb.	...	.1160	.088	.1160	.07¼	.094
Coast, tks . . . lb.	...	.1120	.087	.1120	.06⅞	.094
Coconut, edible, bbls NY . . lb.	...	.12	.04	.12	.04¾	.10¾
Manila, bbls NY . . . lb.	.05½	.05314	.04¾	.05¼	.03¾	.04¾
Tks, NY . . . lb.	.06⅛	.06¼	.03¾	.06¼	.02⅝	.03¾
Tks, Pacific Coast . . . lb.	.05⅞	.06	.03½	.06	.02¼	.02½
Cod, Newfoundland, 50 gal bbls . . . gal.	.35	.38	.36	.38	.34	.40
Copra, bgs, NY . . . lb.	.037	.038	.02	.038	.0012	.021
Corn, crude, bbls, NY . . . lb.	...	.12½	.10½	.12½	.04⅝	.10½
Tks, mills . . . lb.	...	.11	.09½	.11	.03½	.09½
Refd, 375 lb bbls, NY . . lb.	...	.14	.12	.14	.05¾	.12
Cottonseed, see Oils and Fats News Section.						
Degras, American, 50 gal bbls, NY . . . lb.	.05¼	.05¾	.04½	.05¾	.02¾	.05½
English, brown, bbls, NY lb.	.05½	.06½	.05¼	.06½	.03¾	.05⅜
Greases, Yellow . . . lb.	.06½	.06⅝	.05	.06⅝	.02⅜	.05⅛
White, choice bbls, NY lb.	.06¾	.07½	.05¼	.07½	.02¾	.05⅝
Herring, Coast, tks . . . gal.	.28	Nom.	.23	Nom.	.15	.23
Lard Oil, edible, prime . . . lb.	...	.10	.09¾	.10	...	.09¾
Extra, bbls . . . lb.	...	.10	.08½	.10	.07	.08½
Extra, No. 1, bbls . . . lb.	...	.09¾	.08¼	.09¾	.06⅜	.08¼
Linseed, Raw, less than 5 bbl lots . . . lb.	...	.101	.095	.101	.101	.105
bbls, c-l spot . . . lb.	...	.093	.087	.093	.087	.101
Tks . . . lb.	...	.087	.081	.087	.081	.095
Menhaden, tks, Baltimore gal.	.30	Nom.	.25	.30	.15	.25
Refined, alkali, drs . . . lb.	...	.071	.061	.071	.052	.069
Tks . . . lb.	...	.065	.055	.065	.046	.061
Light pressed, drs . . . lb.	...	.065	.055	.065	.046	.057
Tks . . . lb.	...	.059	.049	.059	.04	.05
Neatsfoot, CT, 20° bbls, NY . . . lb.	...	.16½	...	.16½	...	.16½
Extra, bbls, NY . . . lb.	...	.10	.08½	.10	.07	.08½
Pure, bbls, NY . . . lb.	...	.12	...	.12	.12	.13
Oleo, No. 1, bbls, NY . . . lb.	...	.13	.10¾	.13	.06	.11½
No. 2, bbls, NY . . . lb.	...	.12½	.10	.12½	.05⅜	.11¼
Olive, denat, bbls, NY . . . gal.	.88	.90	.84	.95	.76	.90
Edible, bbls, NY . . . gal.	1.65	1.80	1.55	1.80	1.55	1.90
Foots, bbls, NY . . . lb.	.08⅜	.08½	.07⅛	.08½	.06½	.07½
Palm, Kernel, casks . . . lb.	.05⅜	Nom.	.03	.05⅜	.02½	.04¼
Niger, cks . . . lb.	...	.05¾	.034	.05¾	.031	.03¾
Peanut, crude, bbls, NY . . lb.	...	.10⅝	.10½	.10¾	.06½	.10¾
Refined, bbls, NY . . . lb.	...	.14	.12½	.14	.07½	.12½
Perilla, drs, NY . . . lb.	.08½	.08¾	.08⅝	.08¾	.08¼	.09⅝
Tks, Coast . . . lb.	.08	Nom.	.08	.08¼	.07½	.09
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.088	.09	.08	.09	.08	.082
Denatured, drs. NY . . . gal.	.52	.53	.40	.53	.37	.44
Red, Distilled, bbls . . . lb.	.09⅛	.10⅛	.07⅜	.10⅛	.06⅞	.08⅜
Tks . . . lb.	...	.08¼	.06½	.08¼	.06	.06½
Salmon, Coast, 8000 gal tks . . . gal.	.28	Nom.	.25	.28	.15	.21
Sardine, Pac Coast, tks . . gal.	...	.37	.24½	.37	.13	.25
Refined alkali, drs . . . lb.	.071	.075	.065	.075	...	...
Tks . . . lb.	...	.065	.06	.065	...	...
Light pressed, drs . . . lb.	.065	.069	.055	.069	...	...
Tks . . . lb.	...	.059	.049	.059	...	...
Sesame, yellow, dom . . . lb.	.13½	.13¾	.12¼	.13¾	.07½	.13¼
White, dos . . . lb.	.13½	.13¾	.12¾	.13¾	.08	.13¼
Soy Bean, crude Pacific Coast . . . lb.	...	Nom.	...	Nom.	...	Nom.
Dom, tks, f.o.b. mills . . lb.	...	.10	.08	.10	.06	.08
Crude, drs, NY . . . lb.	.106	.11	.086	.11	.066	.09
Refd, bbls, NY . . . lb.	.106	.115	.091	.115	.071	.102
Tks . . . lb.	.10	.10½	.08	.10½	...	...
Sperm, 38° CT, bleached, bbls NY . . . lb.	.099	.101	.099	.101	.106	.11
45° CT, bleached, bbls, NY . . . lb.	.092	.094	.092	.094	.099	.103
Stearic Acid, double pressed dist bgs . . . lb.	.11¼	.12¼	.10	.12¼	.09	.11
Double pressed saponified bags . . . lb.	.11¾	.12¾	.09	.12¾	.09	.10
Triple pressed dist bgs . . lb.	.14¼	.15¼	.12¾	.15¼	.11¾	.13¾
Stearine, Oleo, bbls . . . lb.	.12⅜	.12½	.09¼	.12½	.05	.10⅝
Tallow City, extra loose . . lb.	.06⅞	.07	.05⅜	.07	.02⅞	.05⅜
Edible, tierces . . . lb.	...	.08	.07¼	.08	.04¾	.07¼
Tallow Oil, bbls, c-l, NY lb.	.05¾	.06	.05¾	.06	.05¾	.06
Acidless, tks, NY . . . lb.	...	.09	.07½	.09	.06	.07½
Vegetable, Coast mats . . lb.	.07¼	Nom.	.07¼	Nom.	.06	.07¼
Turkey Red, single, bbls . . lb.	.07½	.08	.07½	.08	.07½	...
Double, bbls . . . lb.	.12½	.13	.12½	.13	.12½	.13
Whale, crude, coast, tks . . lb.	...	.04	...	.04	...	...
Winter bleach, bbls, NY lb.	.076	.078	.07	.08	...	.072
Refined, nat, bbls, NY . . lb.	.072	.074	.064	.074	.064	.07

* New crop shipment tanks .075.

THE CHEMICAL MARKET-PLACE

Local Suppliers

A selected Directory of responsible manufacture-sales agents, and jobbers who maintain spot stocks of chemicals, dye and tanstuffs, gums, naval stores, paint and fertilizer materials and similar products. Let us tell you about our combination contract for space on this page and in our Chemical Guide-Book.

MASSACHUSETTS

DOE & INGALLS, INC.

Chemicals
Solvents

DENATURED ALCOHOL

Full List of Our Products,
See Chemical Guide-Book

Everett Station, Boston EVerett 4610

E. & F. KING & Co., Inc.

Est. 1834

399-409 Atlantic Avenue
Boston, Mass.

Headquarters for
Industrial Chemicals

(CO_2)

Solid Carbon Dioxide

ALAN A. CLAFLIN

Manufacturer's Agent

DYESTUFFS AND CHEMICALS
for
TEXTILE—
TANNING—
PAPER
INDUSTRIES

88 Broad Street Boston, Mass.

TELEPHONE LIberty 5999

RHODE ISLAND

ANILINE OIL

Heavy Chemicals
Textile Specialties

J. U. STARKWEATHER CO.
INCORPORATED
705 Hospital Trust Bldg.
Providence, R. I.

GEO. MANN & CO., INC.

251 Fox Pt. Blvd., Providence, R. I.
(Phone—Gaspee 8466)

Branch Office
NORTH STATION INDUSTRIAL BLDG.
150 Causeway St., Boston, Mass.
(Phone—Capital 2217 and 2218)

Industrial Chemicals
Glycerine
Stearic Acid

Barium Chloride

A Product of exceptional purity

Barium Reduction Corp.
CHARLESTON, W. VA.

1935—A Boom Year?

Brookmire expects the vital recovery forces now at work will bring about a boom in business and stocks. Read the study of this subject in the Brookmire Quarterly which also gives a detailed stock investment program.

You may have a copy, gratis, by requesting Bulletin 64-D.

BROOKMIRE
CORPORATION

551 Fifth Avenue New York

Founded 1904

TENNESSEE COPPER SULPHATE

Guaranteed (99%)

Crystal : Snow : Powdered

Product of: TENNESSEE COPPER COMPANY

•

MANGANESE SULPHATE

(65%)

•

Address Inquiries to:

Southern Agricultural Chemical Corp.
Atlanta, Ga.

U. S. Phosphoric Products Corp.
Tampa, Fla.

Tennessee Corporation
Lockland, O.

Index to Advertisers

"We"—Editorially Speaking

Writes F. M. Pralatowski, Director of the Patent Service, du Pont Cellophane Co.:

My attention has been called to "Chemical Industries" for February 1935 and particularly to the item on page 192 under "We — Editorially Speaking," at the top of column 2.

I must remind you that the word "Cellophane" is the registered trade mark of the Du Pont Cellophane Company, Inc., and refers only to the product made and sold by this Company. If you were referring only to the material made by this Company, you were correct to use our trade mark, but if you were referring to cellulosic raw materials suitable for transparent films in general, you should have used the generic term, transparent cellulose film. If you were referring only to our product, you should have used the trade mark "Cellophane" in such a manner that it would be set apart from the words of the language. It should have been quoted, capitalized, italicized or handled in some similar way.

❖❖❖❖

Once again research does the impossible. This time the "miracle" is an odorless cabbage from "High above Cayuga Waters." It took 4,000 specimens and 6 years to get rid of the "B-O" of the lowly cabbage. Cornell's Professor C. H. Myers is the hero.

❖❖❖❖

Life may begin at forty; but not many men have become chemical manufacturers at fifty and made a big success of it. But Lucien Warner did just that, founding the group of companies which have since grown into the Westvaco Chlorine Products Corp. It all started because he bought a guano island off the coast of French Guiana, and the fascinating story will be told in next month's issue, the second of the biographies of the pioneers who founded our chemical industry.

❖❖❖❖

The "daddy of them all," John Winthrop, Jr., is very fittingly to be the subject in this series in our May issue. It was his little experimental plant for the production of alum and saltpetre, opened in Boston in the spring of 1635, that is the cause of the big three hundredth birthday party which the industry is celebrating.

The first American chemical manufacturer was a man of parts. He was educated at Trinity College, Dublin. He fought Indians. He read scientific papers before the Royal Society. He founded New London. He was Governor of Connecticut. He mined for lead and copper. He was an amateur physician with a couple of pet formulas that were widely famous. He was a book collector. He drafted charters, petitions, and laws. He was the son of a famous father who made good in his own right.

❖❖❖❖

We have reason to be proud of our industrial forefather, and the meeting of the American Chemical Society in New York next month will be a very fitting memorial to him and a monument to the age, size, strength, and importance of the industry which he founded.

❖❖❖❖

The 233 industrial executives who reported to the National Industrial Conference Board on their major problems seem curiously to have overlooked "worrying about Washington," which we opine has taken more energy, more time, and more money during the past twelvemonth than the more or less well-known Depression itself.

❖❖❖❖

Did you know—

That T. S. Grasselli went first to work in his grandfather's chemical company under a sales manager named Mansfield, known familiarly as "I.H." and the father of a son, Howard, who has followed his sire's footprints?

That Theodore Roosevelt, Jr., was once a director of the Barrett Company?

❖❖❖❖

At last we have found a practical definition for the word "Utopia." It is a land where the per head consumption of soap per annum is 5 cakes. Just imagine the personal freedom one enjoys in Soviet Russia, compared to this country where our annual consumption is over 100 cakes!

❖❖❖❖

Supplementing our announcement on this page last month, additional material has made it necessary for us to conclude Mr. Bechtel's splendid series on "Budget Control" in the April issue.

❖❖❖❖

Headline in the *N. Y. Sun*: "Calls Munition Trade Racket," and just below it: "Nye Asks Additional $100,000 for Inquiry." Maybe we're double-visioned, but it reads like two rackets to us.

Fifteen Years Ago

From our issues of March, 1920

$10,000,000 merger of Penick & Ford, Ltd., of Louisiana, and the Douglas Company is announced. Plans to expand the business include the manufacture of corn syrup and glucose.

National Aniline & Chemical announce that they have withdrawn from the jobbing of all goods not of their manufacture.

Calco Chemical closes dye plant at Burlington, N. J., and will carry on latter plant's operations at Bound Brook, N. J.

Dr. Irving Langmuir receives Nichols Medal for most original paper printed in 1919 in the publications of the American Chemical Society.

R. C. Jeffcott, president, Calco Chemical, sails for Europe.

Work is begun on new $600,000 chemical plant of Southern Agricultural, at Atlanta, Ga.

Price of turpentine breaks all records at Savannah, reaching $2 per gallon.

Frederic J. Le Maistre leaves Du Pont to form partnership with W. P. Cohoe, New York, as consulting chemist.

Texas Sulphur prepares to double storage capacity of its ocean shipping plant at Galveston.

Separate Chemical Warfare Service, in charge of a brigadier-general, is feature of Army Reorganization Bill passed by the House.

John E. Kienle appointed general manager of sales for Mathieson Alkali.

Harry L. Derby elected president of Kalbfleisch Corporation.